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Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review

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Abstract

Introduction: Research indicates that people with lower socioeconomic status (SES) appear to receive inferior healthcare and experience worse health outcomes compared to those with higher SES, in part due to bias and prejudice. Implicit bias adversely affects healthcare related decision-making about assessment, investigations, and treatment options.

Aim: To scope the reported impact of Health Professional (HP) bias about SES on clinical decision-making and its effect on the care of adults with lower SES in the wider literature.

Methods: JBI scoping review methods were used to perform a systematic comprehensive search for literature on Medline, Embase, ASSIA, Scopus and CINAHL to identify relevant literature up to March 2023. The scoping review protocol has been published in BMJ Open. A patient and public interest representative was involved in the design and conduct of this review.

Results: Sixty-seven papers were included and were retained in the time frame 1975-2023. Sixty-nine percent of the papers demonstrate a link between implicit bias of SES and HP decision-making. Who the patient is as opposed to what they present has influence on HP decision-making. Stereotyping and bias often affect decision-making when the HP is fatigued or has high cognitive load. HP implicit bias can be mitigated through the assertiveness of the patient with low SES.

Conclusions: HPs hold implicit bias of people with low SES. HP decision-making about care for people of low SES is influenced at times by non-medical factors, assumptions, and stereotypes; a phenomenon that contributes to health inequalities. Practising self-awareness and considering different perspectives may help HP's overcome implicit bias when making decisions, especially when fatigued. Several priorities for further research are identified at the end of this scoping review.

Key Words

Socioeconomic Status, Implicit Bias, Unconscious Bias, Socioeconomic Disparities, Healthcare Disparities, Clinical Decision-making, Healthcare Professionals, Scoping Review.

Article Summary

Strengths and limitations

- To the best of our knowledge, this the first scoping review exploring health professional implicit bias of SES and its influence on Health Professionals decision-making.
- This scoping review has an a-priori published protocol and has been conducted in line with international standards for best practice, to ensure rigor and transparency.
- The inclusion of a patient and public interest representative in the research team added quality to this review, by ensuring that the review is relevant, meaningful, and informed by the perspective of the people that access and utilise healthcare services.
- This work summarises the body of evidence in a clear concise manner, which highlights the patterns, advances, and gaps in what is known about this topic as well as the priorities for future research.
- Due to the nature of funding, only studies published in English were included and therefore this scoping review may have excluded relevant literature published in other languages.
- In keeping with the nature of a scoping review, the quality of literature collected was not evaluated.

Introduction

Socioeconomic status (SES), a social determinant of health, is a key causative and contributory factor to disparities and inequities in morbidity as well as mortality in many nations[1-3]. There is a wide range of robust empirical evidence from many settings which indicates that people with lower SES tend to have a shorter life expectancy and worse health related outcomes in comparison to more affluent people[1-4]. People with higher socioeconomic status (SES) have better life chances, and thrive more than those in other socioeconomic groups[5-7]. The causes of the social gradient in health are complex, and the exact nature of the relationship is difficult to establish, because it is informed by both individual factors such as health behaviour but also factors associated with economic wealth[8-9]. The gradient in health and SES is also subject to a person's power, prestige, and the social connections they enhance[5]. Therefore, SES related healthcare disparities are influenced by how a person's SES is perceived by themselves and others[5-6].

There is evidence that suggests the care people receive is subject to HP implicit bias arising from perceptions of patients with low SES[10]. Every person's thinking is shaped by lived experiences; interacting with people whose lived experience more closely reflects our own can lead people to using a favourable bias; just as unfavourable bias can be attributed to people whose life experience differs from one's own[11].These biases are often subconscious or implicit and manifest in unthinking actions or ill-considered behaviours. HPs and patients hold implicit biases alike, which can influence the healthcare relationship, quality of patient experience and the decisions HPs make[9].SES related implicit biases are reported to influence various aspects of health professional decision-making, such as patient assessment, deciding on investigations, and planning treatment[12]. Better understanding of the impact SES has on HP patient related decision-makings arguably provides a valuable new focus in tackling socio-economic health inequalities[8-9, 12]. Therefore, it would be prudent to undertake a scoping review that maps all pertinent evidence, integrates contemporary knowledge about this topic, clarifies key concepts, sets out evidence-based recommendations for practice and identifies the priorities for future research.

Operational Definitions

It is important to define the concepts at the onset of this scoping review so that there is clarity about their use in this work. Our operational definitions are summarised in a Supplementary Figure and are set out in detail with their underpinning rationale in our protocol for this scoping review [13].

Aim

We sought to scope the reported impact of HP bias about SES on clinical decision-making and its effect on the care for people with lower SES in the wider literature. Our aim in this scoping review was to answer three related research questions:

- RQ1: What has been published about implicit SES bias and HP attitudes or behaviours when deciding and providing care?
- RQ2: How does SES effect the dynamics of the HP and patient relationship?
- RQ3: What recommendations for practice have been postulated, implemented, or evaluated to address HP implicit bias related to SES?

Method

We conducted a scoping review using JBI methodology[16-17] as set out in our a-priori published protocol[13], and report our results in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols and Scoping Reviews (PRISMA-ScR) guidelines[18-19].

Search strategy and data sources

Our literature search was carried out in three stages. In the first stage, an initial search was undertaken on Medline to identify and refine search terminology and consider Medical Subject Headings to ensure a comprehensive strategy that selected all the relevant papers published related to SES and its impact on health care. The Medline search strategy was tested, and the first 100 references scanned by three authors (AC, CJ, and RS) to ensure relevant papers were retrieved. Key papers were checked to confirm they were being retrieved by the search. In the second stage of the search process, the Medline search strategy was adapted for use on other key databases (Medline, Embase, ASSIA, Scopus, CINAHL) [see table 1] to account for differences in controlled vocabulary and database functionality. We also searched the website of key organisations such as professional regulatory bodies, think tanks and policy making bodies for any pertinent publications (see Supplementary Material – Search Strategy for details of the full search). In the final stage of the literature search, we conducted back and forward chaining of included papers to identify any other relevant documents. All searches have been updated since the initial search date, of 21st October 2021 and are up to date as of 9th March 2023.

Table 1: Table of Databases searched.

Date Restriction: None *The start date varies in each of the databases because these are the first available offered by each of the databases.	**Language Restriction:** English only
Database name	**Dates Covered* Up to March 9 2023**
Medline (OVID) & EPub & Medline in process (OVID)	1947 – present
Embase (OVID)	1946 – present
ASSIA (ProQuest)	inception – present
Scopus (Elsevier)	1960 – present
CINAHL (EBSCO)	1976 – present

Screening and selection process

All retrieved citations were exported to the Rayyan systematic review software package and duplicates removed. In the first filter, the titles, and abstracts of the included papers were assessed against the inclusion criteria and independently filtered by two members of the project team (CJ and RS). Any differences with regards to the inclusion or exclusion, were resolved through discussion and after reviewing the full text of the papers in question. In the second filter, the full text papers were assessed against the inclusion and exclusion criteria. Our inclusion criteria are set out in Table 2, as per our protocol[13, 20]. We only included publications in English as this was an unfunded study with no facility for translation[13, 20]. Studies of all designs were included in this review because our focus was on mapping the evidence about the impact of HP bias of SES on clinical decision-making and its effect on the care for people with lower SES.

Table 2: Identification the Population Concept and Context

Population	Concept	Context
❖ People aged 18+ globally.	❖ SES ❖ Papers that discuss a Contributing factor of SES (such as education or income) as defined in the operational definitions.	❖ Health Professional (HP) implicit bias or unconscious bias and interactions with decision-making. ❖ A Health Professional's (HP's) 'attitude' that connects

	Please see the search strategy detailed in the supplementary material attached.	Socioeconomic Status and decision-making.

Design	Setting
❖ Studies of all designs that include primary data including case studies. ❖ Editorials ❖ Opinion papers	❖ Any healthcare setting where a person is assessed and/or care planned by a health professional (HP) including: • Doctors and nurses • Physiotherapist and Occupational Therapists • Speech and Language Therapists • Pre-natal midwifery.

Data extraction and charting

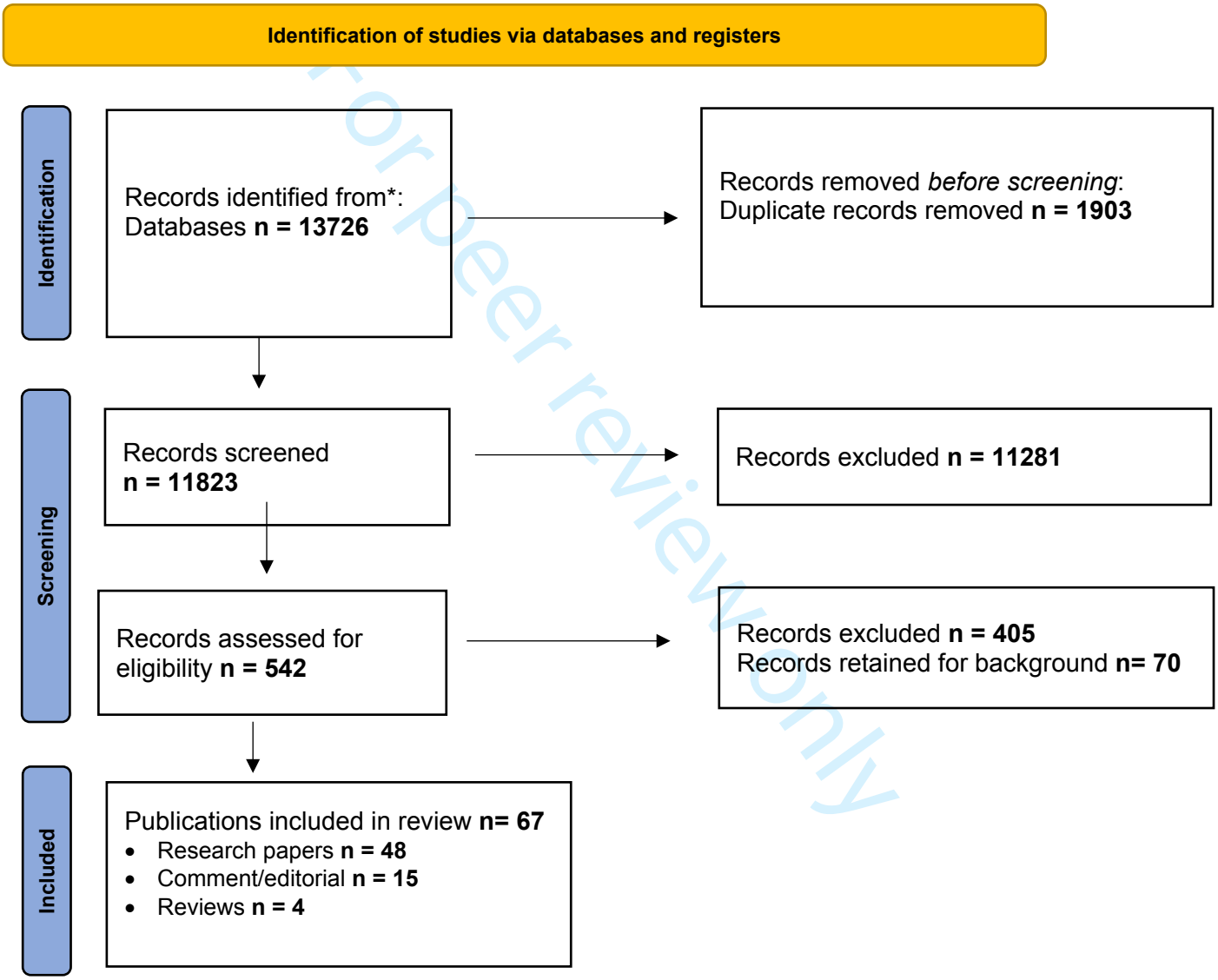
Relevant data were gathered using an adapted version of the JBI data extraction tool systematic scoping reviews[20], that was converted to an Access Database form. This Access database form was tested on the first five papers and then adapted as per JBI guidance to gather all information pertinent to the review questions[20]. On completion of data extraction, the data was exported to an Excel spreadsheet to facilitate data analysis. Our mapping and reporting of the data was also informed by the lived experience and perspective of the patient and public interest representative on our team (BA) as stated in our protocol[13, 21] and consistent with best practice in systematic reviews [21].

Results

Selection of sources of evidence

The PRISMA flow diagram below (Figure 1) summarises how we searched for relevant publications and selected literature for inclusion, in line with best practice in scoping reviews[22]. Data analysis, interpretation, and reporting will be underpinned by the PAGER framework[23].

Figure 1: Prisma Flow Diagram



Summary of characteristics

In our search strategy, we purposively cast a wide net to capture all relevant published papers, because of the complexity of defining SES and in total, we screened 11823 publications across different decades. At first filter, 11281 'off topic' papers were excluded, such as those concerned with children, dentistry, HP career development or focused on SES but not HP decision-making. We selected publications that considered HP decision-making from the HP's viewpoint and excluded papers that explored HP decision-making from the patient perspective.

We reviewed 542 studies for eligibility and retained 67 publications for inclusion in the scoping review. The characteristics of the publications included in this scoping review are presented in a Supplementary Table called Characteristics of Included Publications. Seventy papers were retained for background reading and synthesis, because they provided broader insights about the relationship(s) between stereotyping, bias, and SES. We included a wide range of publications in this review. Forty-eight of the 67 included papers (72%) reported on original research, while the remaining papers were commentaries or opinion pieces (n=15) and reviews (n=4) about aspects of SES and HP decision-making (Supplementary Table called Characteristics of Included Publications). Most included papers, were from the United States of America (67%; n= 45), followed by the United Kingdom (10%; n=7), Canada (6%; n=4) and Portugal (3%; n=2). Two papers involved authorship across national boundaries, and these were labelled as international (3%; n=2). The remaining included papers included involved a single published paper from Denmark, Finland, Mexico, New Zealand, Norway, Sweden, and Pakistan.

The earliest published included research paper retained was by Crane[24] in 1975, who explored the impact of social factors and physiological criteria in HPs treatment decisions about critically ill patients. Crane[24] explored doctor decision-making using case histories and questionnaires; she discovered that there were disparities in doctors' decision-making between a patient with a high-status occupation and another patient described as an unemployed labourer. Doctors in this study [24] offered more aggressive treatment options to people with high status occupations, even though they explicitly stated that they did not rate social status highly in their decision-making process. Crane[24] did not categorise this finding as implicit bias, which may reflect the prevailing socio-cultural beliefs at the time this study was conducted. However, in our view, this finding by Crane[24] is an example of implicit bias and the earliest research study we found. We also noted that from 2008 onwards, there was at least one publication about bias in relation to SES that met the inclusion criteria for this review. The increased frequency of publications from 2008 onward maybe a consequence of the emergence of the Fundamental Causes Theory[3] and a greater understanding of socioeconomic disparities in English healthcare provision facilitated by the Marmot Review [1].

Health Professionals

Thirty-one[9, 24- 53] of the 48 research papers reported on implicit bias in relation to Doctor/Physician clinical practice. The remaining papers explored or discussed decision-making from a multi-professional viewpoint (n=6)[54-59] and this included doctors, nurses or midwives working in multidisciplinary teams. Four research papers[60-63] explored nurse bias and decision-making, four involved medical students[64-67] and two papers[68-69] explored potential bias and decision-making of Psychotherapists/Counsellors. One study[70] was concerned with Occupational Therapists. The implicit bias in nurses and allied health professionals' practice is more evident in recent research studies which may reflects their increasingly central role in clinical healthcare decision-making. We found no studies that explored implicit bias in Pharmacists' decision making. This was a surprise as clinical decision-making is a fundamental aspect of pharmaceutical practice especially in settings such as the UK, where pharmacists have extended roles as non-medical prescribers and must be able assess, diagnose, and treat patients[71-74].

Research Methods

Included primary research papers employed several different methodological approaches (see Supplementary Table called Characteristics of Included Publications). Most research papers (50%, n=24) of used a vignette approach[24, 26-28, 30, 31,33, 35, 38, 42,45-47, 50, 51, 58, 61-65, 67, 69, 70] and some combined the vignette approach with the Implicit Association Test (n=6)[45-47, 51, 61, 65] . Some studies used prospective data collection (n=2)[59, 61], High Fidelity simulation (n=1)[66], retrospective data review (n=3)[40, 48, 57] quantitative survey/questionnaire (n=8)[9, 24, 34, 39, 44, 47, 60, 68], qualitative interview (n=10)[29, 32, 36, 41-43, 49, 54-56], or a qualitative observational approach (n=2)[43, 55].

Vignette studies illustrated the clinical scenario through a video recording (n=11)[26-28, 30, 33, 42, 50, 58, 62, 63, 69], while others used a combination of written case examples and written scenarios with pictures depicting the clinical cases (n=13)[24, 31, 35, 38, 45-47, 51, 61, 64, 65, 67, 70] Representations of SES were indicated based on appearance of the patient, such as how they dressed and/or the description of the person which indicated their occupation. In studies that retrospectively or prospectively examined health data, health insurance status, or area level deprivation measures were applied to patient demographic information to measure the SES of the population.

SES and HP Decision-making

Thirty-four of included primary research studies (69%) reported an association between SES and HP decision-making [9, 24-26, 28, 29, 31, 32, 34-36, 38, 40, 42-44, 47-52, 54-58, 60, 62, 63, 64, 66-68]. Meaning that in over two-thirds of the research papers reviewed HP decision-making about assessment, investigations, treatment, or care was influenced by a person's socioeconomic status. Fourteen papers did not detect any SES related bias in HP decision-making[27, 30, 33, 37, 39, 41, 45, 46, 53, 59, 61, 65, 69, 70]. There were no discernible patterns or trends in the characteristics of these 15 papers, which used a variety of methodologies, involved different HPs across a range of specialty settings. Interestingly, four papers by Haider et al[45, 46, 61, 65] did not find a link between SES and decision-making, but detected high levels of implicit favourable bias towards people with high SES, in doctors[45, 46], nurses[61] and medical students [65]. All these studies[45, 46, 61, 65] combined the Implicit Association Test (IAT) and a vignette-based approach to assess the impact of implicit bias on decision-making. Three of these studies reported that 90.7% of doctors (n=215)[45], 93% of nurses (n=245)[61] and 86% of medical students (n=211)[65] demonstrated an implicit preference toward people with High SES. However, in these studies[45, 61, 65], the high levels of implicit SES bias were not evident in HP's decision-making. This result suggests that not all implicit bias leads to disparities in decision-making.

Table four below displays the research that links SES and decision-making by professional group. Three quarters of the research papers demonstrate a link between SES and decision-making in doctors (n=23)[9, 24-26, (28, 29, 31,32, 34-36, 38, 40-44, 47-52], medical students (n=3)[64, 66, 67] and nurses (n=3) [60, 62, 63]. Half of the studies with multi-professional participants demonstrated a link between SES and decision-making (n=3)[54, 56, 57]. There was not enough data within the included studies that focused on Occupational Therapists and Psychological Therapists, to draw any meaningful conclusions about the relationship between implicit SES bias, and their decision-making (Table 3).

Table 3: Link between SES and HP decision-making per professional group (research papers)

Professional Group	Link found	No link found	link found	Grand Total
Doctor	n=23	n=8	74%	n=31
Medical student	n=3	n=1	75%	n=4
Multi-professional	n=3	n=3	50%	n=6
Nurse	n=3	n=1	75%	n=4
Occupational Therapist	n=0	n=1	0%	n=1
Psychological Therapist	n=1	n=1	50%	n=2
Grand Total	n=33	n=15	69%	n=48

In our included research publications, we identified that there were some medical specialities in which there were three of more research studies exploring SES related implicit bias in HP decision-making (see Table 4). Every included study (n=7; 100%) on pain assessment and/or management[38, 50, 51, 58, 60, 62, 63] reported a link between decision-making and SES. In obstetric/contraception care 60% (n=3) reported a link between implicit SES bias and HP decision-making[40, 54, 56]. More than three quarters of the studies involving cancer care (n=6; 75%)[26, 28, 35, 48, 49, 64] and all but one study (n=7; 87.5%)[9, 25, 32, 34, 47, 57, 66] exploring coronary heart disease (CHD) detected disparities in HP decision-making related to SES. Three of the nine papers that explored multiple conditions detected a link between SES and decision-making[36, 43, 44]. One of the two included research papers on diabetes[42] and mental health[68] found a link between SES and decision-making. The two studies exploring SES and decision-making in trauma care did not detect a link between SES and decision-making[45, 46]. Other specialities listed in table five a single research paper was included; asthma[52], dermatology[41], kidney transplantation[29], palliative care[24] and sickle cell disease[67].

Table 4: Link between SES and HP decision-making per specialty (research papers)

Condition	Link Found	No Link found	Link Found	Total
Cancer Care	n=6	n=2	78%	n=8
Multiple Conditions	n=3	n=6	38%	n=9
Coronary Heart Disease	n=7	n=1	86%	n=8
Pain Assess/Management	n=7	n=0	100%	n=7
Obstetrics/Contraception	n=3	n=2	60%	n=5
Diabetes	n=1	n=1	50%	n=2
Mental Health	n=1	n=1	50%	n=2
Trauma	n=0	n=2	0%	n=2
Asthma	n=1	n=0	100%	n=1
Dermatology	n=1	n=0	100%	n=1
Kidney Transplantation	n=1	n=0	100%	n=1
Palliative Care	n=1	n=0	100%	n=1
Sickle Cell Disease	n=1	n=0	100%	n=1
Total	33	15	-	48

Discussion

As far as we are aware, this scoping review is the first to scope wider literature about the reported impact of HP SES related bias on clinical decision-making, through a comprehensive and systematic search of all the available evidence. This pioneering scoping review has generated key insights into what has been published about HP implicit SES bias, and how it affects HPs attitudes or behaviours as they make decisions about the provision of care for patients. In addition, this scoping review has also revealed how SES can affect the interpersonal dynamics of the HP and patient/service user in their relationship during care delivery. This scoping review has identified strategies, techniques, and recommendations that have postulated, implemented and/or evaluated to address implicit SES bias in HP clinical decision-making. The insights that have been generated from the scoping review can be used to inform efforts to ensure that everyone receives safe high-quality, person-centred, evidence-based care in a just and equitable manner from every HP that they encounter.

Types of publications

The results of this scoping highlighted various aspects of what has been published about implicit SES bias and HP attitudes or behaviours when deciding and providing care. Firstly, the vast majority of the 67 publications included in

this scoping review were original research studies (n=48, 72%), with the remainder being reviews, commentaries, and opinion papers (n=19, 28%). This indicates that there has been a greater focus on building the evidence on this topic by focusing on conducting primary research relative to preparing other types of papers which provide useful and complementary insights. An alternative perspective to consider is that publications such as commentaries, opinion papers, and editorials often contain useful tacit insights and wisdom that constitute '*fugitive knowledge'* or *'soft intelligence'* as they exist beyond formal knowledge structures, because this information is risky to know and share with others through conventional mechanisms[75-77]. Therefore, these valuable insights are challenging to establish and understand using conventional research approaches. So, they may be scope to encourage the publication different types of papers on this topic to facilitate a better understanding of how the SES related perceptions, views, or beliefs of a HP impact on their clinical decision-making in a manner that reflects the reality of healthcare which is delivered in complex adaptive systems.

Geographical location

Many of the papers in this scoping review were authored by people based in the global north, specifically North America and Europe from 1995 onward (n=61, 91%), with the remainder being written by an international team of authors or people based in other parts of the world. This may be an indication of the impact that seminal publications such as the Fundamental Causes Theory[3] and Marmot Review[1] have had in highlighting the relationship between lower SES, health inequalities and poor health related outcomes in these parts of the world. It is also possible that the higher number of publications in these regions may reflect that there is greater scope to access funding for research on the relationship between implicit SES bias and HP's clinical decision-making within these settings. Then, it would be apt for more multinational research on the relationship between implicit SES bias and HP's clinical decision-making within especially those that are low and middle income, or described as developing and transitional, so there is a better understanding of this issue across nations especially those that are in the global south.

Types of HP

It is also worth noting that just under two thirds (n=31)[9, 24-53] of research papers on HP implicit SES bias and decision-making focused doctors/physicians' decision-making, with significantly less studies focusing on interprofessional or multidisciplinary teams (n=6)[54-59], nurses (n=4)[60-63], and medical students (n=4)[64-67]. The number of papers exploring decisions made by 'non-medical' HPs gains increasing interest in the literature after 2008 and reflects the changing landscape of healthcare decision-making, and the extended role of Nurses and Allied HPs. The lower number of research papers exploring decisions made by non-medical HPs may also be an indication of the perceived importance of different healthcare professionals in patient care by those who fund research. The empirical evidence at hand indicates that more is known about doctors/physicians' implicit SES biases and its consequences with regards to their decision-making in other profession. Given the global shift toward more plural approaches to healthcare delivery in which other HPs have extended roles, such as non-medical prescribing, there needs to be greater focus in future research that explores any link between SES and decision-making of other professionals in healthcare and its consequences for patient care.

Research Methods

Our results indicate that the association between HP implicit SES bias and their decision-making has been examined using a variety of different research methods. However, half of the studies (50%; n=24)[24, 26-28, 30,31, 33, 35, 38, 42, 45-47, 50, 51, 58, 61-65, 67, 69, 70] utilised a vignette approach which used a video recording, or combined written case exemplars, scenarios, and images of different types of people. Some studies (n=6)[45-47, 51, 61, 65] used the Implicit Association Test (IAT) to gather data regarding the participants favourable bias as a precursor to vignette examination of decision-making. Regardless of the research method used, in most studies, the information provided to the participants with

regards to SES was predicated on the patient's visual appearance such as the clothes that they were wearing, or how they were described which provided an insight into their profession, and or education.

Given the preponderance of vignetted based research on this topic, it is prudent to consider its utility in understanding HP decision-making. Vignette studies are adept at establishing judgement and decision-making in a variety of professions, which have a high level of applicability and generalisability about how HPs undertake their work on a day to day basis[78, 79]. In addition, vignette studies are an effective way of exploring people's beliefs, perceptions, attitudes, behaviour, and biases[79-82]. However, the utility of this approach in decision-making studies is contingent on the researcher's ability to craft and word a written or visual vignette that reflects the complex nature of reality, and that sets out key information in line with best scientific practice[78-80, 83]. A key issue with the use of vignettes in research is that the information that they contain and convey, may subconsciously relay, or reflect the researchers' own perspectives and/or biases, which may influence the information they provide, as well as how they describe others in the scenarios that they create. Hence, it is widely recommended that the vignettes are evidence-based, reviewed by expert peers, or patients, and subsequently pilot tested ensure that they are valid, culturally appropriate, and clear before they are used in a study[78, 80, 84]. Equally, others[85] have opted to co-create vignettes with members of the population they research to ensure that they are culturally relevant, utilise the appropriate terms, and convey the perspective(s) of the people who are being characterised therein.

There is scope for the greater use of other research approaches such as high-fidelity simulation, prospective data collection, qualitative interviews, qualitative observation, quantitative surveys or questionnaires, and retrospective data reviews in studies on this topic. Conducting future research which uses some of these less commonly used approaches, on their own or in combination may shed new light on hitherto unknown or overlooked aspects of HP implicit SES related bias. This is particularly important as each research method has its own strengths and weaknesses, so using a combination of different approaches facilitates data triangulation, which can lead to more meaningful insights, enhance methodological rigour, and help to draw more robust conclusions from the data.

Measures of SES

When developing the protocol for this study we made the decision to include poxy measures of SES and in retrospect this was an important decision. When exploring HP decision-making a number of proxy measures or indicators of SES have been utilised in the included research papers. Included papers used poxy measures such as occupation/Employment (n=15)[24, 30-33, 43, 47, 50, 51, 60, 61, 64-66, 70], Education (n=14)[9, 29, 36, 37, 39-41, 45, 49, 57-59,62, 70], Income/Finances (n=11)[9, 25, 35, 48, 50, 51, 53-55, 57, 59, 55], appearance/dress (n=7)[26, 30, 33, 42, 63, 66, 69], Health Insurance (n=3) [25, 26, 34]. A Formal SES or deprivation measure was used in only three of the studies included in this review[9, 44, 48] . We are aware that the inclusion of papers with single discrete measures such as these may be contested from a social science perspective, as SES is invariably multifaceted and complex [13]. A comprehensive discussion about the utility or otherwise of different discrete or proxy measures is beyond the remit of this paper, but there are some constraints to the use of some discrete measures such as income as a proxy for SES. The results of this scoping review support our view[13] that proxy measures for SES, albeit with their limitations, can provide useful insights into HP implicit bias and its sequelae for their clinical decision-making about patient care. Therefore, by mapping the different methods that are used to measure and report SES in different types of publications, it is hoped that there is a clear overview of how they have been utilised in different contexts.

Bias and Stereotyping

HPs make different judgements or decisions about assessment, treatment and care based on who the patient is, as opposed to what they present with[42]. Three examples of this are highlighted below drawing on the evidence pertaining to pain assessment/management, maternity/contraception care and cardiac care. Wilson[60], Anastas[51], and Brandao et al.'s[62] studies highlight stereotyping as an influence in HP behaviour and decision-making. Brandao[62] reported that people with low SES were viewed as less credible during pain assessment by a HP.

Anastas[51] and Wilson's[60] studies both found that people with low SES were often viewed as being untrustworthy and incapable during pain assessment, which led to disproportionate concerns about possible opioid addiction and triggered 'gate keeping' behaviours in the HP and this affected pain management decisions. Stereotyping and bias were also reported in maternity and family planning studies[43, 55, 56]. Manzer[56], Smith-Oka[55] and Shawahna's[43] studies identified the adverse impact of stereotyping on HPs assessment and decision-making. In these studies HPs considered women with low SES to be untrustworthy, bad mothers and/or promiscuous, as well as lacking capacity to make sensible decisions about planning future pregnancies[43, 55, 56]. Manzer[56], Smith-Oka[55] and Shawahna[43] studies also reported that women with low SES were subject to biased disparities in advice, guidance, and management that nudged women toward using longer term (and on occasions irreversible) contraceptive options. Agerstrom et al[57] found that people with low SES were more likely to receive delays in cardiac arrest care compared to patients with higher SES. In this study[57], the results revealed that highly educated patients (P <0.001) and patients with higher income (P = 0.001) were significantly more likely to have their heart rhythm monitored prior to the onset of the cardiac arrest (holding all other variables). Heart rhythm monitoring was significantly associated with less delay, shorter duration, increased immediate survival and 30-day survival[57]. In this instance, SES related discrimination was associated with HP decision-making about who gets cardiac monitoring, which impacted on timely cardiac arrest care and patient survival. Goddu et al.'s[67] study highlights that perceptions and stereotyping amongst HPs can be triggered prior of in-person meetings with patients through language and words used in medical records or referral letters. This suggests that SES related stigma and bias can unwittingly be transmitted among HPs through the words and language that are used to characterise the person receiving care as well as to describe their lived experience. Therefore, the words, terminology, and language in reference to the people seeking or receiving care seem to be a key influence and, in some cases, a predeterminant of HP attitudes and behaviour that can adversely affect clinical outcomes.

Social psychologists describe two fundamental dimensions of social perception when considering bias and stereotyping that help us to understand how people see each other [86]. The stereotype content model (SCM) was first proposed by Fiske[87, 88] and provides a theory that explains how individuals form impressions, assumptions, and judgements of other individuals or groups based on their perceived warmth or capability. This theory is useful when making sense of the biases that might be impacting on HP interaction with patients and when making decisions[86]. The first dimension of the SCM relates to the **warmth** of a person, for example, how friendly or trustworthy they appear to be[88]. A person who is cooperative is deemed warm, and a person who is perceived as resistant is perceived as cold[86]. The second dimension relates to the **capability** of the person, for example, how skilled, intelligent, or competent they appear[86]. Warmth is evaluated first because it predicts future behaviour; capability is judged more slowly as it reflects the other person's ability to act competently[88]. In terms of SES or social class, for example, wealthier people are stereotyped as intelligent and better educated, therefore more capable than poorer people of lower SES or class[89]. SES can be signalled in many ways, the way a person dresses, their mannerisms or their accent, and these cues lead to behaviour changes that impact on the interaction between people[89]. The interaction between people is a dynamic process in the context of healthcare, so HPs make conscious and subconscious judgements about the other person, while simultaneously, the person seeking, or receiving healthcare makes similar judgements about the HP, this is then manifest through dialogue and influences how they see each other. Stereotypes do not need to be consciously recognised to generate discrimination, they can be subconsciously held, and triggered in such a way that people use them to frame their actions and to rationalise what they do, or do not do, in an automatic process with little or no thought or self-awareness[90]. Consequently, SES related stereotypes seem to be a contributing factor that maintain health inequalities, given that HP decision-making appears to lead to unwarranted variations in care and treatment[42].

Time and cognitive load

A recurring theme is the reported influence of HP workload on implicit bias and decision-making. There is evidence to suggest that HPs rely on implicit messages to 'fill the gaps' in comprehensive assessment when time and effortful thought are limited or prevented. Several papers[11, 54, 91, 92] suggest that the contribution of cognitive load, stress and limited time-restraints impact on the HP's motivation to suppress implicit bias when making decisions. Self-awareness of one's own prejudice and bias is important when making decisions, but self-awareness is diminished when the HP is busy and does not have sufficient head space to mitigate the impact of potential implicit bias[93]. Decision-making is ideally a controlled process which involves making intentional, conscious, and effortful thought[93]. However, if the HP is engaged in high levels of mental activity, is stressed or has limited time, then this can interrupt, impair or prevent a controlled thoughtful decision[93]. In these circumstances stereotyping is used as an energy saving mechanism that allows for intellectual shortcuts in decision-making that feel comfortable because they fit with what we think we know[11]. Therefore, HPs are less patient-centred in these circumstances and the unique features of the patient (which are discovered during comprehensive assessment) can be replaced with stereotypical patterns based on the patient belonging to a certain social group/s[11, 92, 93]. Brown[54] discovered that HPs took greater effort to ensure the confidentiality of the HIV diagnosis was protected for women with high SES. The HPs in the Brown study[54] considered confidentiality to be less of a priority for the women with low SES because their social position was less important. Brown[54] discovered that this bias tended to be activated when staff were overburdened and/or where health services were poorly resourced. There is also evidence that shows stereotyping can assist in coping with the pressures of HP practice[94]. Spending less time with patients with low SES may be perceived as helping to 'move clinics along,' because of the HP assumption that some people will not need as long as other people in clinic. Patients with low levels of SES, can often be viewed as needing less information because of an assumption they do not wish to be informed, because they ask less questions or because they do not have the capacity to retain information, and this assumption actually helps the clinic to regain lost time[94].

Intersectionality of SES and other factors

Intersectionality refers to the interactivity of different social identity structures such as race, class and gender, and how belonging to more than one social identity group can have a greater negative effect than belonging to one group alone[95, 96]. Our results show that intersectionality can have a powerful cumulative effect on HP assessment and subsequent decision-making. Stereotypes and prejudices are stackable and the proclivity towards discriminatory attitudes, tendencies, and behaviours rises as perceived vulnerability of the person seeking or receiving care increase[96]. Denburg et al[35] explored race and social vulnerability for men with localised prostate cancer and discovered that the higher the perceived patient vulnerability by the HP, the more likely they were to opt for 'watchful waiting' as opposed to active treatment. For example, men who were deemed to have a low income, were widowed, or were characterised as being black by HPs, were the least likely to be referred for radical prostatectomy. McKinlay et al[25] explored non-medical influences on HP decision-making for patients with coronary heart disease and found that discriminatory attitudes and behaviours were linked to the patient's age, perceived level of income, and insurance status. Older adults with low income and without medical insurance were less likely to receive a primary cardiac diagnosis, however this discrimination did not affect younger patients who were low income and without insurance[25]. Fitzgerald's[96] systematic review which explored implicit bias in healthcare professionals, highlighted how perceptions relating to race, SES, and gender intersect, but also interact in complex ways. The intersectional interaction between different factors is arguably a reflection of the continuous nature of perceived warmth and capability matrix as previously described in the SCM, but the outcome for the patient can be bleaker when racial and class biases stereotypes overlap[89]. Our results about the complex intersection of SES and other factors such as race are consistent with wider evidence from other studies. For example, there is evidence which shows that controlling for SES, people who are of Afro-Caribbean heritage are three times more likely to be diagnosed with diabetes than their counterparts of European heritage, while people who are Lesbian, Gay, Bisexual,

Transgender or identify as Queer are more likely to have multiple risk for cardiovascular disease than their heterosexual peers[4]. The evidence collected on intersectionality in this review demonstrates the importance of multivariable reviews of implicit bias, therefore exploring SES, race, age, or gender as individual factors in isolation will not tell the whole story. Instead, the intersectionality the distinctive characteristics, and traits that a person has as well as the social groupings that they belong to must be considered, especially given their complex interactions and cumulative effect on the care of patients is the correct way forward when we seek to understand patient experience.

SES and HP Decision-making

Dialogue plays a key role in how we see each other[97]. Initial impressions of both the HP and patient can be corrected through interaction between both parties [98]. Initial impressions of warmth and competence can be adjusted through dialogue during the assessment and decision-making process. This interaction however requires motivation for one or other party[28]. A motivated HP who offers more time, seeks the input of the patient, and consciously considers equality and/or equity can build a dialogue with the person based on 'what matters most to them'[97]. In the same way a patient who demonstrates existing knowledge and has an active or assertive manner in dialogue with the HP can influence the HP decision-making by altering the HPs assumptions related to the warmth or competence of the patient[28].

Manderbacka[32] exploration of decision-making in relation to 'white collar' and 'blue collar' patients found that doctors were more likely to take a 'doctor-centred model' for communication, assessment and decision-making with patients from a 'blue collar' background, but tended to adopt a 'person-centred and shared decision-making model' with 'white collar' background patients. It is not always the case that a person who is inferred as capable is automatically also perceived as warm on the SCM matrix[99], in fact some research has shown that when a person is viewed as capable and competent then the perception of warmth is viewed less positively[86, 88, 99]. This can mean that when a patient is perceived as lacking capability or competence then their warmth can be viewed more positively as a compensatory effect, which in turn triggers a greater paternalistic behaviour from the HP, that effects their communication style and quality[99]. Castaneda-Guarderas et al[100] and Krupat et al[28] assert that the perceived power differential between the HP and the patient can inhibits shared decision-making because it negatively effects patient trust[100]. Patients are less likely to participate in dialogue and shared decision-making if they perceive the HP as judgemental, in this way HP bias can trigger the patient's bias in a dynamic way, adversely affecting dialogue and patient centred care [28].

Patient assertiveness can lead to more careful diagnostic testing for people who may have been otherwise disadvantaged because of their SES[34]. Barnhart et al [34] explored non-medical reasons for disparities in coronary heart disease treatments and discovered that if patients with low SES adopted a health assertive manner, then their treatment recommendations (revascularisation) more closely mirrored patients who had high SES. Krupat et al[28] explored the effect of patient assertiveness HP decision-making for older adults with breast cancer and similarly discovered that patients with low SES were more likely to have full staging of their cancer investigated when they made assertive requests. In both these studies[28, 34] patient assertiveness led to more careful diagnostic testing for people who may have been otherwise disadvantaged because of their SES. Therefore, there is empirical evidence which suggests that implicit SES bias can manifest itself in HP-patient behaviours that impede relationship building, which could be mitigated with greater HP self-awareness and greater patient assertiveness [28, 34, 97]. Further research is needed to explore the impact of patient assertive requests on HP decision making. Such work is urgently needed to prevent or reduce healthcare inequalities arising from HPs SES related implicit bias, has added importance given the tacit nature of the latter. It is increasingly recognised any such improvement efforts that seek to address health inequalities, such as those caused HPs implicit SES bias, must involve meaningful co-production and dialogue about health inequalities that enables and empowers people to have agency and to take action [101].

Measures to address HP implicit bias related to SES.

We integrated a range of recommendations from included publications into three main themes: further research, education/training and policy, and guidelines. The reviewed papers highlight the need for further research to explore in more detail the reasons and mechanisms in which social factors affect and influence HP decision-making[31, 32, 37, 39, 41, 48, 51, 52, 62] . There is a gap in understanding mechanisms that prevent or inhibit the implicit judgment surfacing as explicit actions, particularly related to HP time and cognitive load [39, 93]. Hence, this gap in understanding is a key priority for any future research and improvement efforts that seek to address HPs SES related decision-making and its negative impact on patient care.

Another recommendation arising from the reviewed papers is the exploration of education and training for both HPs and patient groups which seeks to increase HP self-awareness through perspective taking and/or help patients with health literacy and assertiveness[9, 28, 34, 38, 47, 49, 50, 55, 56, 62, 64, 66]. There appears to be a gap in the evidence that requires further exploration, specifically, there are as yet unanswered questions about how training can successfully raise awareness of SES bias, and how the impact of this training on clinical practice can be assessed or evaluated in the short term and longer term[102]. The impact of health literacy education on SES related bias is outside of this scoping review, but moving forward, it would be prudent to consider how health literacy and assertiveness education with patients might help facilitated more active participation for patients with low SES, which may have a role in reducing health inequalities[34].

Policies, guidelines, and best practice statements, which recognise the impact of SES on HP decision-making are needed to guide the HP when making decisions that inevitably include non-medical factors[36, 49, 54]. A smaller number of papers recommend that any such policies, guidelines, and best practice statements should be constructed with mindfulness of implicit bias [54, 103]. Implicit bias needs to be explicitly discussed and integrated into the policy and guidelines that help to shape HP interactions and patient experience. There is evidence of this work is happening to help support people of global majority heritage who are minoritised because they are categorised as non-white[104]. This work must be expanded to include SES related bias, given pervasive nature, as well as its complex interaction and intersection with race in relation to patient care.

Strengths and limitations

This scoping review has its limitations which must be given consideration. Most included publications are from North America and Europe in the global north, therefore the relevance of its results to other parts of the world, especially those that are part of what is increasingly referred to as the global south is limited. The fact that only articles published in English were included, means that relevant works in other languages will have been omitted from this review. Consequently, the result of this scoping review provided a limited insight into other parts of the world, particularly those where English is not the native language, as well as in places where the organisation and delivery of healthcare takes place in systems that are distinct from those in North America and/or Europe. Conversely, the inclusion of research studies and other types of publications broadened the depth and breadth of this review. There was no critical appraisal or quality assessment of the included research studies, which is in keeping with JBI scoping review methodology[16] [17], and was apt the focus was on mapping the literature on this topic. Drawing upon our diverse range of skills as patient and public interest representative (BA), a Librarian/Information Technologist (AC), and three HP academics (CJ, PG, RS), we reached a consensus on how best to convey the results to others in plain English, a series of recommendations for implementation in practice, as well as the priorities for future research.

Implications for Practice and Policy

A key message arising from this scoping review for health services, professional bodies, and policy makers is that HP's have SES related implicit biases that influence how they organise and deliver patient care. HP decision-making is also subject to non-medical factors, as assumptions are often made about the care of people of low SES based on bias and stereotyping, which causes, or exacerbates health inequalities that can adversely affect patient's clinical outcomes[42]. It is important that we remain mindful that some people do not receive equitable care, so there is a responsibility for all HPs to do what they can to be better informed about their own practice in relation to equity, and to do what they can to address this issue. Heffernan[102] contends that people can find it unpalatable when they are confronted with evidence that challenges their firmly held big ideas, such as HPs who believe that they do no harm and always seek to do good, being informed that their implicit SES related biases may have deleterious impact on the quality, safety, and equity, of patient care. It is always tempting for people to elide over inconvenient truths or unpalatable facts because if they are accepted, then the individual is compelled to deal with things in a different way or to address gaps in their knowledge, attitude, skills, and behaviour, which is nearly always challenging. Turning a blind eye to biases can feel safe for an individual HP, but it is morally untenable as it contravenes the values that underpin healthcare and increasing the likelihood of people who are vulnerable, marginalised, silenced, and/or overlooked by wider society enduring unwarranted variations in care, receiving suboptimal care that is delivered in an iniquitous and unjust manner.

It is challenging for anyone to be truly objective and self-critical about their clinical practice, especially with regards to implicit bias which is tacit and often reflects normalised patterns of thinking and behaviour. In other words, everyone has a rationale or vocabulary of motive, for what they do or do not do, which means that it is challenging for anyone to accept that they have implicit biases, which are often contrary to the way a person thinks about themselves and their behaviour towards others. On the other hand, genuine changes in behaviour and improvement in any human endeavour can only arise when there is a genuine acceptance of truth of the situation, specifically facts and issues at hand, including any implicit biases, with a concomitant theory of action[105]. As challenging as this may be, it is important to bear in mind that a transformation programme of action, especially in terms of improvement, requires a willingness to confront and examine all possible truths by asking searching questions, in this case about the organisation and delivery of healthcare. This sentiment is summed up in the view that not 'knowing something' is understandable because we are human, provided that the person is not turning a blind eye because they 'don't want to know' [102].

Health inequalities endure in part because of a lack of insight or willingness to address social injustice, social indifference, an ideological stance of a vacuum of leadership[101]. Given what this scoping review has surfaced about the potential impact of implicit SES related HP bias greater consideration is needed about how the results can inform efforts to reduce health inequalities. Healthcare commissioners, policy makers, educators, and regulatory bodies would do well to ensure that everyone involved on the organisation and delivery of healthcare, especially HPs know that implicit SES related bias increases the risk of the most vulnerable people in society.

Conclusion

We included 67 papers which explored different aspects of SES related implicit bias of SES and HP- decision-making, but most publications were written by authors based in the USA. The amount of research on this topic has grown over time and has shifted more recently from the previous focus on doctors to other HPs, which reflects the increasingly plural approach to healthcare through interprofessional teamworking as well as the widening boundaries to scope of practice for non-medical professionals that has taken place. In addition, the focus of research has developed with the increasing use of vignette-based studies in this field. There has also been a rise in the use of Implicit Association Testing that was developed to detect subconsciously held HP biases in this field.

There is a gap in wider knowledge about the circumstances in which implicit bias is most likely to surface, but there is some evidence that this might be related to the HP's cognitive load, as time pressures can diminish self-awareness. Research that focuses on the differences in decision-making based on non-medical factors when the HP has limited time and high cognitive load, would help the health community to better understand this potential influence, which would in turn help when considering education and training aimed at perspective taking and self-awareness. It is important that real world solutions are considered with HPs that goes beyond education and training to identify safe guards in HP decision making that aim to ensure decisions are equitable and fair, as well as consideration of interventions aimed at improving patients' health literacy and assertiveness.

This review has collected sizable evidence that HPs hold implicit bias of people with low SES, it is important therefore to consider mechanisms to reduce the impact of this bias on decision-making. HP decision-making is at times influenced by non-medical factors for people of low SES, and assumptions are made based on implicit bias and stereotyping, which compound or exacerbate health inequalities. A person's social position is linked to their power and for people of low SES a power imbalance between them and the HP often exists. Implicit bias comes to the fore prior to, during and after the dynamic interaction between the HP and the patient, which itself can reinforce or embed perceptions and judgemental attitudes that further impede due and proper mutual regard for other within this dyad, which militate against the delivery of safe, just, and equitable, healthcare.

Greater awareness as well as acknowledgement of the pernicious nature and potential impact of HPs implicit SES related bias and it's sequalae on patient care on a macro, meso, and micro level is needed. Policy makers need to integrate raising awareness of this into policy and guidelines, remind health services and individual HPs that bias of SES can make vulnerable people more vulnerable and may adversely affect clinical outcomes.
In sum, our review underscores the pressing imperative for research and theory development to underpin healthcare organisation, as well as HPs professional practice, education, professional developments, and regulation. We conclude by highlighting the most pressing unanswered research questions from our scoping review that need to be addressed , in the hope that this much needed work will be undertaken promptly. The three key research questions that must be prioritised in future work in this area are:

1. Does cognitive load reduce self-awareness of SES implicit bias and impact on the decision-making of the HP?
2. What are the best conditions to support shared decision-making with people who have low SES?
3. What training do HPs need to raise their self-awareness of implicit SES related bias and reduce its impact on their decision-making?

Figure legend Caption

Figure 1: Prisma Flow Diagram

Author Contributions

CJ, RS, PG, AC and BA discussed and refined ideas regarding the search strategy. AC developed the search strategy and conduced the database searches. CJ and RS extracted data and drafted the results . CJ is lead author and guarantor. CJ, RS and PG discussed and drafted the discussion of the paper with contribution from AC and BA.

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Competing Interests

None of the people listed below declare any conflict of interest which may arise from being named as an author on this manuscript.

Patient, Public Involvement Statement

This scoping review [and it's previously published protocol] has been developed with a member of the public (BA). The design of this scoping review draws upon BA's personal experience of living with, and beyond a cancer diagnosis, which entails regular contact with health services and healthcare professionals. Therefore, BA's lived experience and perspective has directly shaped the design, results, discussion and implication sections of this work.

Author Statements

Conflict of Interest Statement

None of the people listed below declare any conflict of interest which may arise from being named as an author on this manuscript.

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Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review

Tables

Table 1: Table of Databases searched.

Date Restriction: None *The start date varies in each of the databases because these are the first available offered by each of the databases.	**Language Restriction:** English only
Database name	**Dates Covered* Up to March 9 2023**
Medline (OVID) & EPub & Medline in process (OVID)	1947 – present
Embase (OVID)	1946 – present
ASSIA (ProQuest)	inception – present
Scopus (Elsevier)	1960 – present
CINAHL (EBSCO)	1976 – present

Table 2: Identification the Population Concept and Context

Population	**Concept**	**Context**
❖ People aged 18+ globally.	❖ SES ❖ Papers that discuss a Contributing factor of SES (such as education or income) as defined in the operational definitions. Please see the search strategy detailed in the supplementary material attached.	❖ Health Professional (HP) implicit bias or unconscious bias and interactions with decision-making. ❖ A Health Professional's (HP's) 'attitude' that connects Socioeconomic Status and decision-making.

Design	**Setting**
❖ Studies of all designs that include primary data including case studies. ❖ Editorials ❖ Opinion papers	❖ Any healthcare setting where a person is assessed and/or care planned by a health professional (HP) including: • Doctors and nurses • Physiotherapist and Occupational Therapists • Speech and Language Therapists • Pre-natal midwifery.

Table 3: Link between SES and HP decision-making per professional group (research papers)

Professional Group	Link found	No link found	link found	Grand Total
Doctor	n=23	n=8	74%	n=31
Medical student	n=3	n=1	75%	n=4
Multi-professional	n=3	n=3	50%	n=6
Nurse	n=3	n=1	75%	n=4
Occupational Therapist	n=0	n=1	0%	n=1
Psychological Therapist	n=1	n=1	50%	n=2
Grand Total	n=33	n=15	69%	n=48

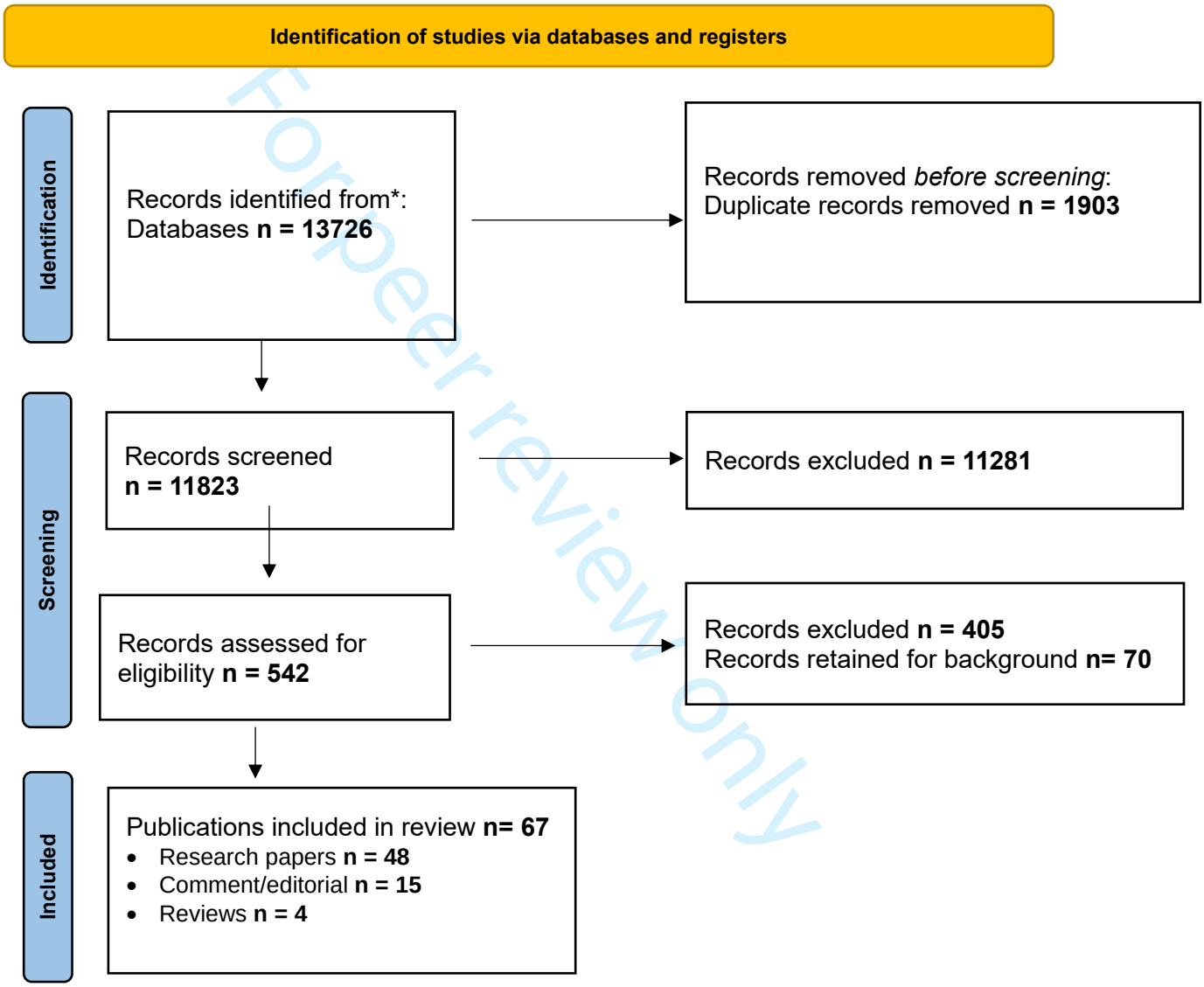
Table 4: Link between SES and HP decision-making per specialty (research papers)

Condition	Link Found	No Link found	Link Found	Total
Cancer Care	n=6	n=2	78%	n=8
Multiple Conditions	n=3	n=6	38%	n=9
Coronary Heart Disease	n=7	n=1	86%	n=8
Pain Assess/Management	n=7	n=0	100%	n=7
Obstetrics/Contraception	n=3	n=2	60%	n=5
Diabetes	n=1	n=1	50%	n=2
Mental Health	n=1	n=1	50%	n=2
Trauma	n=0	n=2	0%	n=2
Asthma	n=1	n=0	100%	n=1
Dermatology	n=1	n=0	100%	n=1
Kidney Transplantation	n=1	n=0	100%	n=1
Palliative Care	n=1	n=0	100%	n=1
Sickle Cell Disease	n=1	n=0	100%	n=1
Total	33	15	-	48

Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review

figures and Illustrations

Figure 1: Prisma Flow Diagram



Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review

Supplementary Material – operational definitions

Box 1: Key terms and their operational definitions in this scoping review

Key term	Operational Definition
Health Professional (HP)	Any registered healthcare professional including Doctors, Surgeons, Nurses, Midwives, or Allied Healthcare Professionals.
Clinical Decision-making	A judgement or decision that influences any aspects of care organised or delivered by the HP such as choices made about the diagnostic tests, and referrals seeking specialist input. It also includes decisions about specific treatments such as surgical procedures, therapies, or medications, as well as ceasing or withdrawing active treatment.
Socio Economic Status (SES)	Any single discrete measure of SES as set out in the Multiple Indices of Deprivation or the Multidimensions of Deprivation, including factors such as income, education, physical environment or neighbourhood quality, and health [14-15]. Any discrete measures that can be used as a proxy for the SES of a patient in HP decision-making such as income, unemployment, education.

Supplementary Material – Search Strategies

Medline ALL (OVIDSP): 1946 to present

1. Socioeconomic Factors/
2. employment/
3. unemployment/
4. Economic Status/
5. Educational Status/
6. Medical Indigency/
7. exp Social Class/
8. exp Health Status Disparities/
9. exp Healthcare Disparities/
10. exp Poverty/
11. exp poverty areas/
12. ((social or socio economic or socioeconomic or economic or income) adj4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*)).tw.
13. ((education* or employment) adj2 (status or level)).tw.
14. (sociodemographic or socio demographic or income or wealth or poverty or affluen*).tw.
15. SES.tw.
16. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 12 or 13 or 14 or 15
17. exp Clinical Decision-Making/
18. exp Decision Making/
19. Patient Care Management/
20. exp disease management/
21. ((Clinical or medical or health or treatment*) adj2 (decision* or decid* or option* or choice*)).tw.
22. (treatment* adj2 (select* or recommend* or receipt)).tw.
23. 17 or 18 or 19 or 20 or 21 or 22

24. exp Prejudice/

25. exp "Attitude of Health Personnel"/

26. exp Professional-Patient Relations/

27. exp Unconscious, Psychology/

28. "unconscious bias*".tw.

29. ((Implicit or explicit) adj3 (cognition or bias*)).tw.

30. prejudice.tw.

31. stereotyp*.tw.

32. Classism.tw.

33. (treatment* adj2 (unequal or differential)).tw.

34. (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or "General Practitioner*" or GP*) adj3 (attitude or judg* or bias)).tw.

35. exp Health Personnel/

36. exp Students, health occupations/

37. 35 or 36

38. exp Psychology, social/

39. exp Mental Processes/

40. 38 or 39

41. 37 and 40

42. 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 41

43. 16 and 23 and 42

EMBASE (OVIDSP): 1947 to present

1. socioeconomics/

2. economic status/

3. income group/

4. poverty/

5. exp employment status/

6. exp educational status/

7. exp social status/

8. exp health care disparity/

9. exp health disparity/

10. ((social or socio economic or socioeconomic or economic or income) adj4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*)).tw.

11. ((education* or employment) adj2 (status or level)).tw.

12. (sociodemographic or socio demographic or income or wealth or poverty or affluen*).tw.

13. SES.tw.

14. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13

15. exp clinical decision making/

16. exp medical decision making/

17. exp decision making/

18. patient care/

19. disease management/

20. ((Clinical or medical or health or treatment*) adj2 (decision* or decid* or option* or choice*)).tw.

21. (treatment* adj2 (select* or recommend* or receipt)).tw.

22. 15 or 16 or 17 or 18 or 19 or 20 or 21

23. exp prejudice/

24. exp cognitive bias/

25. exp health personnel attitude/

26. exp professional-patient relationship/

27. exp ego development/

28. exp stereotypy/

29. prejudice.tw.

30. stereotyp*.tw.

31. Classism.tw.

32. (treatment* adj2 (unequal or differential)).tw.

33. (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or "general practitioner*" or GP*) adj2 (attitude or judg* or bias)).tw.

34. exp health care personnel/

35. exp health student/

36. 34 or 35

37. exp social psychology/

38. cognition/

39. mental function/

40. 37 or 38 or 39

41. 36 and 40

42. 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 41

43. 14 and 22 and 42

44 limit 43 to english language

ASSIA (Proquest): 1987 to present

((MAINSUBJECT.EXACT.EXPLODE("Socioeconomic factors") OR MAINSUBJECT.EXACT.EXPLODE("Socioeconomic indicators") OR MAINSUBJECT.EXACT.EXPLODE("Socioeconomic conditions") OR MAINSUBJECT.EXACT("Employment") OR MAINSUBJECT.EXACT("Unemployment") OR MAINSUBJECT.EXACT("Poverty") OR MAINSUBJECT.EXACT.EXPLODE("Low income people") OR ab((social NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((socio economic NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((socioeconomic NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR

determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((sociodemographic OR socio demographic OR income OR wealth OR poverty OR affluen*))) AND (MAINSUBJECT.EXACT.EXPLODE("Decision making") OR ab(((Clinical OR medical OR health OR treatment*) NEAR/2 (decision* OR decid* OR option* OR choice*))) OR ab((treatment* NEAR/2 (select* OR recommend* OR receipt))))) AND (MAINSUBJECT.EXACT("Bias") OR MAINSUBJECT.EXACT.EXPLODE("Cognitive bias") OR MAINSUBJECT.EXACT.EXPLODE("Prejudice") OR MAINSUBJECT.EXACT.EXPLODE("Health professional-Patient relationships") OR ab(((Implicit OR explicit) NEAR/3 (cognition OR bias*))) OR ab("unconscious bias*") OR ab(Classism) OR ab((treatment* NEAR/2 (unequal OR differential))) OR ab(Stereotyp*) OR ab((("Health professional*" OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR SHO* OR surgeon* OR student* OR AHP* OR allied OR physio* OR speech OR occupational OR Dietitian* OR therapist* OR radiographer* OR midwi* OR "general practitioner*" OR GP*) NEAR/2 (attitude OR judg* OR bias*)))) OR ab(prejudice*))

Scopus (Elsevier): 1960 to present

((TITLE-ABS-KEY (social W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR (TITLE-ABS-KEY ("socio economic" W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR (TITLE-ABS-KEY (socioeconomic W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ((TITLE-ABS-KEY (sociodemographic)) AND (TITLE-ABS-KEY (income OR wealth OR poverty OR affluen*))) OR (TITLE-ABS-KEY (employment OR unemployment))) AND ((TITLE-ABS-KEY (clinical W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (medical W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (health W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (treatment W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY ((treatment OR clinical) W/2 recommend*))) AND ((TITLE-ABS-KEY ("health professional" -patient W/1 relations)) OR (TITLE-ABS-KEY (doctor-patient W/1 relations)) OR (TITLE-ABS-KEY (clinician-patient W/1 relations)) OR (TITLE-ABS-KEY (nurse-patient W/1 relations)) OR (TITLE-ABS-KEY ("unconscious bias*")) OR (TITLE-ABS-KEY ((implicit OR explicit) W/3 bias*)) OR (TITLE-ABS-KEY ((implicit OR explicit) W/3 cognition)) OR (TITLE-ABS-KEY (classism)) OR (TITLE-ABS-KEY (prejudice*)) OR (TITLE-ABS-KEY (("Health professional" * OR nurse* OR doctor* OR clinician* OR physician* OR

registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi*) W/2 attitude*)) OR (TITLE-ABS-KEY (("Health professional" * OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi*) W/2 bias*)) OR (TITLE-ABS-KEY (treatment* W/2 (unequal OR differential))) OR (TITLE-ABS-KEY (("Health professional*" * OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi* OR “general practitioner*” OR GP*) W/2 judg*)))

CINAHL (EBSCO): 1976 to present

S52 S16 AND S24 AND S50 Narrow by Language: - english

S51 S16 AND S24 AND S50

S50 S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S49

S49 S45 AND S48

S48 S46 OR S47

S47 (MH "Mental Processes+")

S46 (MH "Psychology, Social+")

S45 S43 OR S44

S44 (MH "Students, Health Occupations+")

S43 (MH "Health Personnel+")

S42 AB (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi*) N2 (attitude or judg* or bias*))

S41 TI (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or “general practitioner*” or GP*) N2 (attitude or judg* or bias*))

S40 AB (treatment* N2 (unequal or differential))

S39 TI (treatment* N2 (unequal or differential))

S38 AB Classism

S37 TI Classism

S36 AB stereotyp*

S35 TI stereotyp*

S34 AB prejudice

S33 TI prejudice

S32 AB ((Implicit or explicit) N3 (cognition or bias*))

S31 TI ((Implicit or explicit) N3 (cognition or bias*))

S30 AB "unconscious bias*"

S29 TI "unconscious bias*"

S28 (MH "Unconscious (Psychology)")

S27 (MH "Professional-Patient Relations+")

S26 (MH "Attitude of Health Personnel+")

S25 (MH "Prejudice+")

S24 S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23

S23 AB (treatment* N2 (select* or recommend* or receipt))

S22 TI (treatment* N2 (select* or recommend* or receipt))

S21 AB ((Clinical or medical or health or treatment*) N2 (decision* or decid* or option* or choice*))

S20 TI ((Clinical or medical or health or treatment*) N2 (decision* or decid* or option* or choice*))

S19 (MH "Disease Management")

S18 (MH "Decision Making+")

S17 (MH "Decision Making, Clinical+")

S16 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15

S15 AB SES

S14 TI SES

S13 AB (sociodemographic or socio demographic or income or wealth or poverty or affluen*)

S12 TI (sociodemographic or socio demographic or income or wealth or poverty or affluen*)

S11 AB ((social or socio economic or socioeconomic or economic or income) N4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*))

S10 TI ((social or socio economic or socioeconomic or economic or income) N4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*))

S9 (MH "Economic Status")

S8 (MH "Poverty Areas")

S7 (MH "Poverty+")

S6 (MH "Healthcare Disparities")

S5 (MH "Health Status Disparities")

S4 (MH "Social Class+")

S3 (MH "Unemployment")

S2 (MH "Employment+")

S1 (MH "Socioeconomic Factors+")

Supplementary Material 2. Scoping Review Data Extraction Tool

Adapted from the JBI Scoping Review Data Extraction tool[20]

Scoping Review Details	
Scoping Review title:	Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review
Review objective/s:	To scope the reported impact of HP bias about SES on clinical decision making and its effect on the care for people with lower SES in wider literature
Review question/s:	• RQ1: What has been published about implicit SES bias and HP attitudes or behaviours when deciding/providing care. • RQ2: How does SES effect the dynamics of the HP and patient relationship? • RQ3: What recommendations for practice have been postulated, implemented, or evaluated to address HP implicit bias related to SES.
Inclusion/Exclusion Criteria	
Population: Adults	
Concept: SES	
Context: HP decision making	
Types of publication or evidence source	
Evidence source Details and Characteristics	
Citation details (e.g., author/s, date, title, journal, volume, issue, pages)	
Country	
Context – professional group	
Disease group (if applicable)	
Participants (details e.g., age/sex and number)	
SES Terminology used.	
Details/Results extracted from source of evidence	
SES effect on HP and patient relationship	

Implicit biases, attitudes or behaviours that connect SES and decision making	
Healthcare professionals' decision making, and the impact of the decisions made **Types of Healthcare professionals, care context and/or setting**	
Recommendations for practice to mitigate bias	
Identify how SES was measured in the included papers.	

Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review

Supplementary Material 4 – Characteristics of Included Publications

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
1	Crane (1975) USA	**Research Paper** Vignette case studies and Questionnaire	To assess the appropriateness of social as compared to physiological criteria in deciding to treat critically ill patient.	**Doctors** Internal Medicine and Neurosurgery	Case studies based on occupation and employment. A Banker and an unemployed Labourer.	**Yes**	doctors did differentiate between a patient with a high and low status occupation when making decisions about the aggressiveness of treatment offered. However, when asked to rank the relative influence of social characteristics upon their decisions to treat chronically ill patients, they ranked social criteria as having a low influence on their decision-making.
2	Eisenberg (1979) USA	**Editorial/Comment** NA	Sociologic Influences on Decision-Making by Clinicians	**Doctors** Specialism not specified.	This paper reviews the contributions to our understanding of sociologic influences on clinical decision-making.	**NA**	The bulk of the available literature implies a significant relation between social class and decisions regarding patient management. Further investigation is needed- various methods of sociologic research could be used to provide the data for these studies e.g., participant observation, record review, questionnaires, interviews, case studies, or direct recording of the interaction.
3	MacCormick et al (1990) Canada	**Research Paper** Vignette – Four clinical scenarios	To assess decision-making in cancer treatments using age and SES as independent variables.	Medical Students	Occupation and employment were used as a proxy for SES. In this study SES was assessed with age. and it is difficult to separate these in the results.	**Yes**	Personal bias of the physician plays a role in decision-making about treatment for cancer in these vignettes. It is difficult to separate age and SES these in the results. Statistically significant differences $p<0.001$ in decisions to treat younger professional than older persons. Statistically significant differences $p<0.001$ in decisions to treat a young mother than a young female "mentally handicapped" person.
4	Brown (1993) USA	**Research Paper** Interviews and focus groups. seventy-two health, social work, administrative research, and advocacy HPs	Exploration of class and confidentiality for mothers with HIV.	Multi-professional Obstetrics:	Income	**Yes**	Lower social class people not viewed as holding their confidentiality as a personal priority - it matters less to them. Mums with greater authority due to income, political or social standings can expect greater confidentiality compared to mothers who are less economically fortunate.
5	McKinlay et al (1996) USA	**Research Paper** Vignette video scenarios 1. Chest pain 2. Dyspnoea	To assess non-medical influences on decision-making.	**Doctors** coronary heart disease.	socioeconomic status, and health insurance coverage.	**Yes**	A link found between insurance coverage on cardiac diagnosis for chest pain, particularly in the older patients. Intersectionality with Age. Among the older patients, those with insurance were significantly more likely to receive the primary cardiac diagnosis than those without insurance, whereas among younger patients' insurance had no effect.
6	McKinlay et al. (1997) USA	**Research Paper** Vignette cancer video scenarios involving a breast mass	To assess non-medical influences on decision-making	**Doctors** Breast Cancer	Patient characteristics were varied in the videotapes to indicate socioeconomic status: dress, grammatical style, and insurance status	**Yes**	Women of lower SES were more likely to receive less aggressive care ($p<0.07$). physicians recommended either chemotherapy or tamoxifen to 73% of higher SES women, compared with 53% of lower SES women. Insurance and ability to pay also were associated with disparity in physician recommendations.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
7	Feldman et al 1997 USA	**Research Paper** An Experimental Technique Using Videotapes, Factorial Design, and Survey Sampling.	To assess non-medical influences on decision-making.	**Doctors** Secondary care	Challenging to ascertain how SES was measured or described	**No**	The data suggest that the physician subjects gave clinically valid answers to the questions and that the variations in clinical decision-making identified by the factorial experiment can be interpreted as generalizable differences.
8	Wolder-Leven et al 1998 USA	**Editorial/Comment** Social Class and Medical Decision-making	People of different classes may receive differential treatment from providers for the same health conditions due to discrimination based on class.	**Doctors** Specialism not specified.	Paper discusses SES measures - as indicators of class. The word class works as a shorthand to refer to a person's social location, a "lived reality," in which life chances, values, health and well-being, morbidity and mortality, and concepts of self, other, and collectively are shaped by the relationship of the individual to the social organization of production. Should stop trying to define class in terms of a set of socioeconomic indicators such as income level.	**NA**	it is important to recognize that giving people the same choices about medical treatments does not necessarily mean that they are being treated equally, because patients do not lead equal lives. At the point of medical decision-making it becomes clear that class-based differences can even lead to difference between life and death.
9	Parens 1998 USA	**Editorial/Comment** Social Class and Medical Decision-making.	Bioethicists often discuss issues of social class in relation to access to health services - bioethics literature reveals that class is rarely a focus in the analysis of medical decision-making.	**Doctors** Specialism not specified.	considering a person's SES might lead to not offering treatment to a person who does not have the resources and only offering it to people with those resources. An understanding of class and its relationship to medical decision-making should be used to provide equity and not to explain away unwarranted variations in care.	**NA**	Health care providers need to listen to patients in unaccustomed ways, the next and much bigger step will be to think systematically about how to promote such listening particularly with time constraints on health professionals.
10	Krupat et al 1999 USA	**Research Paper** Vignette – Video	To determine whether assertive patient behaviour influences physician decision-making in the treatment of older breast cancer patients.	**Doctors** Cancer	Socioeconomic status [as well as age, race, mobility, general health, and assertive behaviour] of the patients were varied.	**Yes**	Assertive behaviour on behalf of a women with lower SES helps them to get testing e.g., auxiliary node biopsy. Assertiveness led to more careful diagnostic testing for patients who came from groups that are "disadvantaged."

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
11	Gordon et al 2000 USA	**Research Paper** Cross-sectional study design, interviews using semi-structured questionnaire of physicians and patents.	An assessment of Patient-Nephrologist discussions about kidney transplantation as a treatment option	**Doctors** Haemodialysis and Nephrologists	SES determined by education level, occupational level, and socioeconomic status level. All low to high rated.	**Yes**	Bias is not overtly discussed however finding show fewer medical explanations and less time spent with patients of Low SES. Patient age and socioeconomic status influence discussions of transplantation as a treatment option. low socioeconomic status patients were less likely to report being encouraged even after adjustment for transplant suitability.
12	Van-Ryn et al 2000 USA	**Research Paper** Survey data examined	The degree to which patient race and socio-economic status effects physicians' perceptions of patients	**Doctors** post-angiogram care.	A three-category measure of SES was developed. The SES index was created by standardizing patient income and education and averaging the two together.	**Yes**	Intersectionality with race is difficult to unpick. Low SES patients viewed as less likely to be pleasant and rationale. physicians gave lower SES patients more negative ratings on personality characteristics (lack of self-control, irrationality) and level of intelligence.
13	McKinlay et al 2002 USA	**Research Paper** Vignette video study 1. Polymyalgia 2. Depression	To assess the influence of non-medical factors on decision-making.	**Doctors** Internalist and primary care	SES depicted by appearance and employment in the video vignettes	**No**	SES of the patient does not show any impact on decision-making.
14	Tamayo-Sarver (2003) USA	Vignette 1. Ankle Fracture 2. Migraine Non-traumatic back pain.	To measure the Effect of Race/Ethnicity and Desirable Social Characteristics on Physicians Decisions to Prescribe Opioid Analgesics	**Doctors** Emergency Department	Occupation and/or relationship with a primary care provider.	**Yes**	Race did not impact on prescribing differences. SES and information about patient social desirability (e.g., occupation) increased the rates of prescribing for the migraine and back pain patient vignette, but this did not alter the rate for ankle fracture. There were statistically discernible increases in the rate of prescribing, 4% ($p<0.04$) for migraine and 6% ($p<0.01$) for back pain. The information on socially desirable characteristics may have affected physicians' perceived likelihood that the patient is feigning illness and surreptitiously seeking opioids.
15	Henley et al 2004 USA	**Editorial/Comment** 10 steps for avoiding health disparities in your practice	Discussion about disparities and health inequalities.	**Doctors** Specialism not specified.	Discusses intersectionality. The evidence regarding differences in the care of patients based on race, ethnicity, gender, and socioeconomic status suggests that if this patient is a woman or African American or from a lower socioeconomic class, resultant morbidity or mortality will be higher.	**NA**	Recommends that minimising the effect of bias and stereotyping could be achieved for all patients by using evidence-based practice guidelines.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
16	Manderbacka 2005 Finland	**Research Paper** Exploratory qualitative study	Trace key points in the treatment where patients gender & SES experience differences	**Doctors** Coronary heart disease.	Blue-collar and white-collar occupations	**Yes**	There was a doctor-centred model common among blue-collar workers and an increased patient centred model with shared decision-making common among those using private care 'white collar occupations. The utilization of private care is clearly concentrated in higher socioeconomic groups in Finland.
17	Arber et al 2006 UK	**Research Paper** A video-simulation experiment. Conducted simultaneously in both USA and UK	Patient characteristics and inequalities in doctors' diagnostic and management strategies relating to CHD.	**Doctors** Coronary heart disease	SES indicated by occupation and dress - middle class (schoolteacher) or working class (cleaner in UK; janitor in US). Class was also expressed by style of dress and appearance.	**No**	Class was not significantly associated with any aspect of doctors' information gathering or decision-making.
18	Barnhart et al 2006 USA	**Research Paper** Questionnaires developed from focus groups.	Can Non-medical Factors Contribute to Disparities in Coronary Heart disease treatments.	**Doctors** coronary heart disease	socioeconomic status discussed in terms of finance barriers - social support (ability/insurance to pay for a revascularization procedure) as judged by the physician.	**Yes**	People with low SES were not trusted by the physician. Patients most knowledgeable (and assertive) about the procedure, and those with resources, who were most likely to adopt a healthy lifestyle (as perceived by the physician) are most likely to receive recommendations for revascularisation.
19	Denburg et al 2006 USA	**Research Paper** Randomised, 2X2 factorial design clinical vignette.	The Influence of Patient Race and Social Vulnerability on Urologist Treatment Recommendations in Localized Prostate Carcinoma.	**Doctor** Cancer	Middle income (and married) Low Income (and widowed) therefore the variables were not distinct.	**Yes**	Watchful waiting offered more frequently for socially vulnerable patients (low income and widowed) - both white and black patients. Intersectionality means that low income/widowed black patients received the lowest referral for radical prostatectomy. Low income/widowed white men also received lower referral for prostatectomy.
20	Bernheim et al 2008 USA	**Research Paper** A Qualitative Study semi structured interviews	Influence of Patients' Socioeconomic Status on Clinical Management Decisions.	**Doctors** Primary care	As described by the participants: Economic Uninsured - Unemployed- On welfare- Sociocultural- Low educational achievement- Poor social networks.	**Yes**	All physicians recounted circumstances in which the patient's SES did affect their clinical management decisions. Even physicians who initially asserted that all patients in their practice received identical care later described differences based on patient SES.
21	Eggly et al 2008 USA	**Research Paper** Video recorded outpatient interactions during which oncologists invited patients to participate in clinical trials.	Oncologists' recommendations of clinical trial participation to patients	**Doctors** cancer	SES determined by education: high school or less technical or trade school college or greater.	**No**	Data showed that people with higher education (0.07) received more recommendations than men and those with lower education. This was not statistically significant.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
22	Ling Fan et al 2008 USA	**Review** A search of the Internet identified thousands of Web sites, documents, reports, and educational materials pertaining to health and pain disparities.	Awareness and Action for Eliminating Health Care Disparities in Pain Care: Web-Based	**Multi-professional** Palliative care.	Paper discusses SES	**NA**	Studies have explored the factors influencing the often-unintentional pervasive nature of biases and stereotyping that affect treatment decisions for managing pain. Discriminatory practices that are deep seated in biases, stereotypes, and uncertainties around communication and decision-making processes contributing to inequities in care.
23	Franks et al 2008 USA	**Editorial/Comment** This paper examines a hierarchy of three domains for interventions to address health inequalities downstream. 1. health system 2. provider–patient interactions 3. clinical decision-making	Upstream or fundamental causes (such as poverty, limited education, and compromised healthcare access) is essential to reduce healthcare disparities. But such approaches are not sufficient, and downstream interventions, addressing the consequences of those fundamental causes.	**Doctors** Specialism not specified.	Paper discusses SES	**NA**	Physician biases likely to contribute to disparities. Greater social and cultural distance between providers and patients increases the potential for suboptimal encounters. Patients at greater social risk for adverse health outcomes have encounters characterized by less patient participation and providers viewing those encounters more negatively.
24	Nampiaparampil et al 2009 USA	**Research Paper** Vignette - double-blinded randomized controlled study.1. patient with chronic low back. 2. lower extremity pain	To assess the contribution of non-medical decision-making to the assessment and management of pain.	**Doctors** rehabilitation community hospitals	Medical insurance Blue Cross Vs Medicaid	**Yes**	Unable to unpick race and insurance status in these vignette examples. Patient ethnicity/SES differences in the prescription of morphine (p = 0.053). Patient ethnicity/SES significantly affected the rate of referral for a nerve block (P = 0.04).
25	Wilson 2009 UK	**Research Paper** Vignette – case scenarios. One of two patient scenarios was employed in a self-administered questionnaire	Scenarios and Questionnaires addressed pain knowledge, inferences of physical pain, general attitudes, and beliefs about pain management. The participants were required to identify the patient's pain level and make pain management decisions.	**Nurses** pain	The variable lifestyle/socio-economic status (SES) of the patient was manipulated; all other patient variables were kept constant. High SES - businessperson Low SES - unemployed construction worker	**Yes**	There was a difference in pain management between high and low SES patients - both general and CNS nurses showed inferences of patient pain and management decisions which are based on myths about Low SES addiction. There was an observed trend to be more likely to under medicate low SES over high SES patients.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
26	Ceballo et al 2010 USA	**Research Paper** A three-page survey was mailed to physicians in one state. Case scenario of a young women trying to get pregnant. The patient's race and social class varied across the surveys.	Surveyed about their knowledge of infertility among different demographic groups of women and examines how patient and physician characteristics may influence physicians' treatment responses to hypothetical infertile patients.	**Doctors** Family planning	Different educational groups were used to reflect social class differences among women.	**No**	Referral practices did vary related to insurance status of the patient. Physicians' reluctance to refer Medicaid patients to infertility specialists is explained as understandable given the great expense of specialized infertility services and the lack of Medicaid insurance coverage for such services.
27	Gilbert et al 2010 Canada	**Research Paper** A retrospective cohort study of women with a previous Caesarean section.	Does Education Level Influence the Decision to Undergo Elective Repeat Caesarean Section Among Women with a Previous Caesarean Section.	**Doctors** Obstetrics	Education level was stratified.	**Yes**	Higher education is associated with an increased rate of elective repeat Caesarean section ($p<0.047$ and $p<0.03$). Whether this is due to patient differences or physician bias, physicians should be aware of this disparity and should attempt to provide unbiased informed consent for all women
28	Hajjaj et al 2010 UK	**Research Paper** Semi-structured qualitative interviews were conducted with clinicians working in departments of dermatology	Assessment of nonclinical influences, beyond diagnosis and severity, on clinical decision-making in dermatology.	**Doctors** Dermatology	Education level and financial status and treatment related costs	**Yes**	This paper does not offer a strong link between SES and decision-making. Sixty five percent of clinicians said that treatment-related costs that patients are likely to incur would sometimes influence their decision- making inability to afford transportation costs or cost of child minding at home. 19.6% clinicians raised education/intelligence as an issue especially relating to cases where systemic treatments with potential side-effects are required. Where there is a lack of awareness or understanding of the range of influences, there is a risk that some influences may *subconsciously* adversely impact on optimal decision.
29	Kristine Bærøe and Berit Bringeda 2011 Norway	**Editorial/Comment** A discussion about the conditions for acceptable and unacceptable priority settings with respect to patients' socioeconomic status.	The pattern is equal in all countries, the higher the socioeconomic status (SES) of patients, the better the health and the higher the life expectancy; health prospects are distributed along a social gradient.	**Doctors** Specialism not specified.	Paper discussed SES	**NA**	Health inequity in healthcare services by inaccurate interpretations of 'healthcare need' and biased care due to unconscious influence by patients' SES. Prioritisation of health need according to SES as a basis of equity is not ethical. Socioeconomic Factors and their impact on health should be forefront of HP thinking - raising awareness in order to prevent reinforcement of health inequity.
30	Detsky 2010 USA	**Editorial/Comment** HP provide services and make decisions about diagnostics, treatments, procedures etc. There are variations.	The paper discusses… … GPs and surgeons are biased against women, people from low SES groups, and other minority groups?	**Doctors** Specialism not specified.	Paper discussed SES	**NA**	Unintentional bias, which is far more common than intentional corruption, is particularly worrisome because humans are facile with rationalizing and often are not even aware of their bias. It is difficult to overcome bias that one does not even know is there.

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31	Paul Dieppe 2011 UK	**Editorial/Comment** A discussion about the inequalities in the provision of surgical Interventions for people with Rheumatology conditions.	In the context of state provided healthcare - many studies have shown that older people, women, ethnic minorities, and those of lower SES are all likely to receive variations in inventions compared to well-off, middle aged white males.	**Doctors** Rheumatology	Paper discussed SES	**NA**	The paper finds significant effects of SES on both hip and knee joint replacement rates for people with Osteoarthritis. It suggests that GPs and surgeons are biased against women, low SES patients, and other minority groups.
32	Dougal et al 2010 USA	**Research Paper** Online national survey	the influence of SES was examined on psychotherapists cognitive attributions and counter-transferences.	**Psychological therapists** Mental Health	Paper discusses SES	**Yes**	SES impacts on counter-transference reactions and clinical judgments according to SES. Rated interpersonal behaviour of the client with higher SES has evoking feelings of dominance more so than the lower SES. CAS measurement of 'causal attribution' found no statistically significant differences related to clinical judgment
33	Haider et al 2010 USA	**Research Paper** Clinical vignettes. The survey included the Implicit Association Test (IAT) to assess unconscious preferences	To estimate unconscious race and social class bias among first-year medical students and investigate its relationship with assessment.	**Medical students**	Social class was depicted using occupation. Patient vocation is commonly used as a proxy for social class. Patient occupations were chosen using the NamPowers occupational prestige scale, which ranks occupations on a scale from 1 to 100.	**No**	IAT testing showed A preference toward those in the upper class among 174 students (86%). a lower-class preference in 6 (3%). Multivariable analyses for all vignettes found no significant relationship between implicit biases and clinical assessment. Analysis stratified by patient race or class did not demonstrate any statistically significant association between student IAT scores and how students assessed patients for any of the vignettes. No interaction between IAT D scores and vignette patient class (or race) was found for any of the vignettes.
34	McKinlay et al 2012 USA	**Research Paper** A factorial experiment using video vignettes was conducted. 1. Patient symptoms of diabetes 2. Known diabetes with emerging peripheral neuropathy.	To investigate additional causes of health care disparities in the decision-making of primary care doctors.	**Doctors** Primary care	Appearance altered to reflect Class. Men presented with collar and tie (upper SES) or plaid shirt and jacket (lower SES). Women presented with either blazer with broach and makeup (high SES) or sweatshirt and no makeup (lower SES).	**Yes**	clinical management (specifically for foot neuropathy) is influenced by patient socioeconomic status (SES). Overall, upper SES patients would receive these essential examinations compared with lower SES patients. Upper SES patients were slightly more likely to be asked questions about their medical history ($P < 0.05$ for history of eye disease) and were more frequently referred to ophthalmologist ($P = 0.024$).

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
35	Shawahna et al 2012 Pakistan	**Research Paper** Qualitative with two observational phases. Semi-structured interviews - 2 hospitals, 2 diabetes care centres and 2 private clinics. Prescriptions were analysed for socioeconomic indicators. In the second phase, the opinions of a panel of prescribers on the influence socioeconomic indicators on prescribing behaviour were elicited.	To investigate physician's perspectives of patients' SES and the important indicators influencing prescribing behaviour.	**Doctors** Diabetes	participants described SES based on 'job role' and a judgment about whether the person might be able to afford treatment.	**Yes**	Literacy, educational background, compliance, dress, and appearance were important indicators at the time of clinical decision-making for physicians originating from urban areas. Participating physicians agreed that patient's socioeconomic status influenced their drug prescribing behaviour
36	Smith-oka 2012 Mexico	**Research Paper** Interviews and participant observation	To investigate Risk – motherhood in a Mexican public hospital.	**Multi-professional Doctors, Midwives, and Nurses**. Obstetrics	Income and area od residence	**Yes**	Good mothers are married, knowledgeable, follows norms. Bad mothers are unmarried, uneducated, deviant. These views thought to reflect the paternalistic class structure of Mexican society. Explicit bias of low SES single mothers evident in this research - linked again to cooperation. Pressure for sterilisation Vs the use of an IUD in low SES women.
37	Lay-Yee er al 2013 NZ	**Research Paper** Sample of 9272 encounters at 185 family practices. Each practitioner was asked to provide data on themselves and on their practice, and to report on every fourth of their patients (a 25% sample) in each of two week-long periods separated by an interval of six months. The questionnaire recorded data about the patient, his or her problems and their management.	social disparities in health are pervasive features of health care systems. studying inter-practitioner variation in clinical activity across four payment types in New Zealand primary care system.	**Doctors** Primary Care	deprivation level - NZ multi-index of deprivation used quintiles 1-5	**Yes**	There was greater variability of practitioner decision-making for socially disadvantaged patients found in fee-for service settings. Practitioners may have difficulty processing relevant clinical information for socially disadvantaged patients, and this greater degree of uncertainty may in turn be reflected in more variable decision-making. While there was little evidence in this primary care sample of systematic bias in clinical activity level by patient social group, practitioner variability was much more marked for patients drawn from ethnically and socio-economically disadvantaged background.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
38	Haider et al 2014 USA	**Research Paper** Participants completed nine clinical vignettes, each with three trauma/acute care surgery management questions. social class IAT assessments were completed by each participant. Multivariable, ordered logistic regression to test IAT on decision-making.	To assess Unconscious race and class bias and Its association with decision-making by trauma and acute care surgeons	**Doctors** Trauma	Social class stated in Vignette.	**No**	90.7% demonstrated an implicit preference toward upper social class persons. Biases were not statistically significantly associated with clinical decision-making So despite high levels of implicit bias this did not alter the decisions made by the physician in a statistically significant way.
39	Haider et al 2015 USA	**Research Paper** Prospective Vignette study conducted among surgical RNs. Implicit association tests (IATs) for social class and race. Ordered logistic regression	To assess unconscious Race and Class Biases among Registered Nurses.	**Nurses** Surgery	patients' race or social class were randomly altered. Social class vignettes used patients' occupations as proxies for their social status.	**No**	93.47% demonstrated an implicit preference toward upper social class persons. Participants were more likely to think that a lower SES with anxiety did not understand the procedure and needed to be re-consented. Intersectionality detected between race and SES and the use of post-surgical restraints and sedation. Implicit biases among RNs did not correlate with clinical decision-making. Presence of an unconscious bias was not associated with any overall differences in vignette-based clinical assessment and decision-making.
40	Haider et al 2015 USA	**Research Paper** Clinical vignettes, each with 3 management questions. Ordered logistic regression analysis on the Implicit Association Test (IAT) scores and used multivariable analysis to determine whether implicit bias was associated with the vignette responses.	To assess the relationship between unconscious bias and clinical decision-making	**Doctors** Surgery	The paper does not state how SES was communicated via the vignette style study.	**No**	Although implicit biases of race and social class were present among most of the trauma and acute care clinician respondents, these biases were not associated with clinical decision-making. Clinicians were less likely to order an MRI of the cervical spine for patients with neck tenderness after a motor vehicle crash for low SES patients - this is hypothesised to be linked to health insurance status.
41	John-Henderson 2015 USA	**Editorial/Comment** Implicit bias od SES discussed along with as implicit bias of race, gender, suicidal ideation, and obesity).	Implicit cognition implications for global health	**Doctors** Mental health	paper discusses the use of the MacArthur SES scale - which is a self-rated 'place a cross on the ladder to indicate your position' scale	**NA**	Biases and discussed alongside resilience. The paper recommends an investigation into why some HPs make biased decisions and some do not. This could reduce the overall impact of implicit biases on health, both at the level of the individual and by positively affecting the relationship between patient and physician.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
42	Williams et al 2015 USA	**Research Paper** Vignette based study - surveyed seniors at 84 medical schools. two clinically equivalent management options for a set of cardiac patient vignettes. examined variations in student recommendations.	Investigation of variations in medical student recommendations based on patient race, gender, and socioeconomic status.	**Doctors** coronary heart disease	Patient SES was determined solely by the Hollingshead Occupational Scale and was fixed for each individual vignette but varied across the set of eight cardiac vignettes.	**Yes**	Patient SES was a strong and significant predictor of student recommendations. With some intersectionality - when the patient was presented as being in the lowest SES group (SES 1–2), students were more likely to recommend procedures for black patients, and least likely to do so for white female patients. Judgmental attitudes from providers, even if not explicitly expressed, negatively affect physician–patient trust.
43	Castaneda-Guarderas et al 2016 USA	**Editorial/Comment** A discussion about shared decision-making with vulnerable Populations in the Emergency Department.	This paper considers the future research agenda needed to examine shared decision-making with vulnerable populations of people who present to emergency departments in the U.S.	**Doctors** Specialism not specified.	Discussed in terms of Socioeconomic Disadvantage uneducated unemployed uninsured	**NA**	Shared decision-making in the ED setting among patients with socioeconomic challenges may be inhibited by a perceived power differential between physicians and their patients, beyond that experienced by more affluent patients.
44	Elholm Madsen et al 2016 Denmark	**Research Paper** An experimental factorial vignette survey was used. Four different vignettes describing fictitious patient cases with different SES variables were randomly allocated to therapists working in somatic hospitals.	To investigate whether occupational therapists and physiotherapists are influenced by the patient's SES	**Occupational Therapist** Somatic care	Employment status and educational level were used as a proxy for SES. a white collar-worker (lawyer employed and unemployed) a blue collar-worker (janitor employed or unemployed);	**No**	There were no statistically significant associations between the patient's SES and the judgements related to the patient's rehabilitation OR the rehabilitation effort given in phase one or towards providing equal treatment in a therapeutic situation.
45	Popescu et al 2016 USA	**Research Paper** Retrospective 1995 - 2007 data collected from the SEER programme. Key interests were race and SES.	to understand whether between-physician and within physician variations play a role in cancer care disparities among seniors with breast and colorectal cancer enrolled in a national cancer surveillance program.	**Doctors** Cancer	Measured SES using patients' zip code median household income, categorized into deciles. SEER files contain several zip code and census tract-level SES variables.	**Yes**	Patients residing in high-income zip codes were more likely to receive treatment than patients residing in low-income zip codes (e.g., 69%, 53%, and 65% top decile income patients received BCS, chemotherapy, and radiation vs. 46%, 48%, and 43% bottom decile income patients).

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46	Fitzgerald et al 2017 International	**Systematic Review** PubMed, PsychINFO, PsychARTICLE and CINAHL were searched for peer-reviewed articles published between 1st March 2003 and 31st March 2013. Two reviewers assessed the eligibility of the identified papers based on precise content and quality criteria. The references of eligible papers were examined to identify further eligible studies.	To assess publications examining implicit bias in healthcare professionals.	**Multi-professional** NA	SES	**Yes**	All studies found evidence for SES implicit biases among physicians and nurses. Class may trump race in some circumstances so that being high SES is more salient than being non-white. Based on the available evidence, physicians, and nurses manifest implicit biases to a similar degree as the general population. Biases also exist for age, mental illness, weight, having AIDS, brain injured patients perceived to have contributed to their injury, intravenous drug users and disability.
47	Murphy et al 2017 USA	**Editorial/Comment** A discussion about socially at-risk populations in relation to health disparities.	Increasingly, it is recognized that disparities are driven not by differences in biology or individual patient characteristics, but rather by social determinants, or the conditions of the environments in which people live.	**Doctor** Specialism not specified.	Paper discusses socioeconomic position	**NA**	Bias manifests itself in behaviours that impede relationship building. Physicians with higher levels of general bias are more likely to talk slowly, have greater verbal dominance, and have less patient-centred dialogue. Implicit bias influences diagnosis, treatment recommendations, questions asked of the patient, and diagnostic tests ordered.
48	Pettit et al 2017 USA	**Research Paper** High-fidelity simulation - randomly assigned to participate in a simulation of acute coronary syndrome. Students were blinded to study objectives. quantitative data were obtained on the number of times students performed the following patient actions: acknowledged patient by name, asked about pain, conversed, and touching the patient.	To test the effect of socioeconomic status bias on Medical Student–Patient interactions using an Emergency Medicine Simulation.	**Medical Students**	Mannequin - low SES depicted by a homeless person - dirt covered t-shirt and trousers. Mannequin - High SES depicted by executive dress - button down collar suit and tie etc.	**Yes**	Data demonstrate that Medical Students were more likely to ask the simulated patient with high SES about pain control ($p = 0.04$) and more likely to touch the low SES patient ($p = 0.01$). Paper discusses touch as a mechanism to communicate compassion - put could also be a display of power. Decision-making does not appear to be different - patient received aspirin and was sent for a cardiac catheterization in both groups.

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49	Goddu et al 2018 USA	**Research Paper** Randomized vignette study of two chart notes employing stigmatizing versus neutral language to describe the same hypothetical patient, a 28-year-old man with sickle cell disease.	To assess if words matter… to assess if Stigmatizing Language aids in the transmission of Bias in the medical record	**Medical Students**	Vignette language portraying the patient negatively with irrelevant or unnecessary indicators of lower socioeconomic status such as hanging out with friends outside McDonald's.	**Yes**	Language may play a powerful role in influencing clinician attitudes and behaviour. Less aggressive pain management employed with the hypothetical patient who had low SES.
50	Brandao et al 2019 Portugal	**Research Paper** Two experimental Vignette studies	To investigate classism in pain care and the role of patient socioeconomic status on nurse's pain assessment and management practices	**Nurse** Pain	SES was manipulated by level of education and occupational activity	**Yes**	Overall, the higher-SES patient was perceived as having more intense pain than the lower-SES patients. The low-SES patient's pain was perceived as less credible than the high-SES patient's pain when distress cues were present. Patient SES influenced some of the nurses' pain assessments but not their management practices.
51	Gonzales et al 2019 USA	**Research Paper** A telephone interviews incorporating Logistic regression models that assessed associations between race/ethnicity/education, medical discrimination, clinician mistrust, and treatment decision-making with concordance	To assess the associations between race/ethnicity/education, medical discrimination, clinician mistrust, and treatment decision-making and guideline concordance.	**Doctors** Cancer	Education level	**Yes**	Intersectionality. Socioeconomic factors influenced guidelines concordance. They found educational disparities in breast cancer treatment. Non-college-educated Black women had lower odds of guideline-concordant care vs. college-educated White women.
52	Hirsh et al 2019 USA	**Research Paper** Vignette style study. A randomized controlled trial.	To test a virtual perspective-taking intervention to reduce race and SES disparities in pain care	**Doctors** Pain	SES was represented visually by work attire: low SES patients - fast food uniform, and high SES – a business suit.	**Yes**	Statistically reliable treatment bias during the pain treatment decision-making pre-intervention. Forty seven percent of providers who were biased at baseline did not show a statistically reliable treatment bias one week later.
53	Vlietstra et al 2020 UK	**Research Paper** Vignette – participants randomised to one of two video vignettes. Representing a psychological assessment session with either a 'lower' or 'upper' class client.	To assess for SES variations in clinical reasoning, namely diagnosis, risk assessment and treatment, and to measure class self-awareness.	**Psychological therapeutic professionals** Working in the NHS	Class The accent and dress of the client were varied to elicit class stereotypes.	**No**	There was little difference in clinical reasoning between the two class conditions. The paper acknowledges that the dress variations did not portray class cues accurately or strongly enough to evoke a difference.

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54	Anastas et al 2020 USA	**Research Paper** Vignette - 12 computer-simulated patients with chronic back pain that varied by race and SES (low/high). IAT also employed.	To assess provider attitudes on Chronic Pain Care Decisions.	**Doctor** pain	SES was indicated by occupation and depicted by clothing.	**Yes**	Strong implicit preference for high SES over low SES individuals. There were significant race × SES interaction effects on provider ratings of pain interference, distress, and workplace accommodations.
55	Bynum 2020 USA	**Research Paper** Four doctors from two Community Health Centres convenient sample because they offer services to uninsured people	To assess the doctor's (Asthma Management) perceptions of uninsured patients.	**Doctors** primary care	Uninsured	**Yes**	3 out of the 4 Doctors indicated that low SES patients have issues with medication compliance. All the participants indicated that access to affordable medication due to patients' SES was a barrier. Paper states that it might be possible to improve physicians' decision-making through techniques that minimize biases.
56	Crandlemire 2020 Canada	**Editorial/Comment** A discussion about the literature regarding healthcare disparities for people with low SES and the role of unconscious biases held among healthcare providers.	Unconscious Bias in Nursing is more likely activated and more prevalent during high pressure or time sensitive scenarios, when people are busy and tired, or when decisions need to be made and there is missing or ambiguous information.	**Nurses** Specialism not specified.	SES	**NA**	Decision-making is influenced by both positive and negative attitudes toward people due to unconscious or conscious biases held by healthcare providers which can affect patient care outcomes.
57	Diniz et al 2020 International (different countries)	**Research Paper** A Mixed methods study. Video vignette: Two women, each doing two different pain-inducing movements. After watching the vignette nurses were asked to: 1. Associate five characteristics to the women.	Examined how nurses' perceptions of pain patients' SES were associated with (more or less) dehumanizing inferences about their pain and different treatment recommendations.	**Nurses** Pain	The video vignette women SES was determined using the MacArthur Scale of Subjective Social Status (based on appearance). Low and middle SES women chosen for the videos.	**Yes**	Words associated with the middle SES women were - calm, friendly, informed, anxious, sociable. Words associated with the lower SES women were - withdrawn, tough, passive, hardworking, worried, poorly informed. Treatment decisions are similar except the low SES patient is referred to psychoeducation- because of a perceived lack of competence.

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		2. write a brief story to describe 'the woman's pain and how it affects life recommending a treatment.					
58	Veesart et al 2020 US	**Editorial/Comment** A discussion about unconscious bias and how it might impact on nursing care.	Everyone has a cultural lens through which we view the world, which can sometimes create biases. Often, the decisions we make are directly influenced by those biases, even when we espouse other beliefs.	**Nurses** Specialism not specified.	SES	**NA**	Making decisions based on prejudices can have devastating impacts on nursing care. The first step in addressing this is self-awareness. Bias decisions often occur under stressful situations
59	Beyer et al 2021 UK	**Systematic review** Included works published between January 2004 and April 2020. PubMed, Embase and Cochrane Central databases	To assess the current evidence for factors that influence treatment decision-making in localized kidney Cancer	**Multi-Professional** cancer	socio economic status and education status - as reported in the primary papers.	**Yes**	Education status, socioeconomic status, a family history of cancer, and cancer anxiety can be barriers to treatment decisions in kidney cancer. SES and economic variables were identified as barriers to treatment decisions.
60	Chase 2021 USA	**Editorial/Comment** A discussion regarding health disparities research and the negative stereotypes and attitudes that providers can hold toward certain patient groups.	Biased interactions with providers are a dynamic two-way process that can influence patients' satisfaction and trust in the health care provider. Leading to impairments in the patient's health outcomes.	**Muti-professional** Cancer	SES	**NA**	Advantageous and standard-of-care treatments may not be recommended to certain patients because physicians believe that those patients may not adhere to them. When faced with limited time to adequately assess the patient's problem, physicians may rely on their implicit stereotypes to make hasty decisions.
61	Khidir et al 2021 USA	**Research Paper** Cross-sectional analysis of a sample taken from 100% of Medicare claims for emergency department (ED) visits. ED visits from January 1, 2016, through December 31, 2019. Decision about admission or discharge were analysed according to race, Medicaid, and low income.	To estimate the consistency of ED physician admission propensities across categories of patient sex, race and ethnicity, and Medicaid enrolment.	**Doctors** Emergency care	insurance status - low income.	**No**	Doctors who are more or less likely to admit patients from the ED are more or less likely to do so regardless of SES. No evidence of SES bias and decision-making about admission established.

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62	Manzer et al 2021 USA	**Research Paper** Qualitative Interviews	To assess bias through the case of contraception.	**Multi-professional** Family Planning.	SES and Class	**Yes**	Participants link pregnancy risk to women of low SES. Differences in contraception advice found. HPs more likely to steer patients of low SES toward long-acting contraception - can last 1 year or more, rather than prioritizing patients' preferences. HP Bias decision-making may be exacerbated by the fast-paced, high-stress environments and lack of time.
63	Agerstrom et al 2021 Sweden	**Research Paper** A retrospective multiple regression analysis study. Data extracted from Swedish LISA database	To examine SES disparities in In Hospital Cardiac Arrest (IHCA) treatment and survival. Assessing SES at the patient level and controlling other variables to assess impact of SES.	**Multi-professional** Cardiac Care	SES proxy used highest level of completed education and annual income.	**Yes**	Patients with lower SES, low income and low education were all significantly associated with more delay, and lower levels of immediate and long-term survival. People with high SES are more likely to have their heart rhythm monitored prior to the IHCA, despite having better health (less comorbidity). Heart Rhythm monitoring was significantly associated with less delay and increased immediate survival and 30-day survival.
64	Bernardes et al 2021 Portugal	**Research Paper** Vignette: Drawing on a social psychological model of dehumanization. Two online experimental studies were conducted. vignettes/images depicting 2 cases of women with chronic low-back pain, followed by videos of them performing a pain-inducing movement.	To test the effect of patient socioeconomic status on pain assessment and management. Also, whether patient dehumanization and perceived life hardship mediated these effects.	**Nurses and Medical Students** Pain	SES was manipulated: level of education (incomplete high school education Vs degree) and occupation (factory worker Vs Judge).	**Yes**	Medical students: pain assessment was less comprehensive for low SES. They rated the low SES patient as having slightly lower pain intensity during movement but perceived her as more credible and with higher pain-related disability. Nurses: pain assessment was less comprehensive for higher SES. Nurses reported being slightly more willing to offer individualized care to the low SES patient. Lower SES patients were perceived as being more disabled by the pain.
65	Kirkham et al 2022 UK	**Editorial/Comment** A discussion about the Department of Health funded evaluation of the MIDIRS about Informed Choice leaflet. Stereotyping can be a defence mechanism which assisted midwives in coping with the pressures of work.	Midwives sometimes misjudged women's ability and willingness to participate in their maternity care and, therefore, women can be negatively labelled about things like housing tenure or social class [or age].	**Midwives** Maternity	Social class discussed	**NA**	SES stereotyping judgements affect Midwives behaviour. Low SES Women's silence reinforced the staff's perception that 'they don't want information.' It may also enable busy clinics to move at an 'efficient' and 'reasonable' pace.

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66	Bruno et al 2022 Canada	**Research Paper** Prospective cross-sectional study from five primary care practices. A randomized controlled trial of a diabetes goal setting and shared decision-making plan.	To assess if SES is associated with empathic communication and decision quality in Diabetes Care.	**Multi-professional** Diabetes	Patient self-reported their ethnicity, education level and income prior to the trial.	**No**	Shared decision-making was not impacted by low education or income.
67	Torres et al 2022 USA	**Review** Literature review	To assess implicit biases among healthcare providers, the influence of implicit biases on providers' medical judgments and communication, and the mechanisms by which this impaired patient-physician communication affects patients' health outcomes and disease prognoses.	**Doctors** Gynaecology Oncology	Paper discusses SES	**NA**	SES and insurance status impacts on unequal care and quality of care. SES associated with non-adherence to clinical guidelines.

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Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Scoping Review

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Abstract

Objectives

Research indicates that people with lower socioeconomic status (SES) receive inferior healthcare and experience poorer health outcomes compared to those with higher SES, in part due to Health professional (HP) bias. We conducted a scoping review of the impact of HP bias about SES on clinical decision-making and its effect on the care of adults with lower SES.

Design

JBI scoping review methods were used to perform a systematic comprehensive search for literature. The scoping review protocol has been published in BMJ Open.

Data Sources

Medline, Embase, ASSIA, Scopus and CINAHL were searched, from the first available start date of the individual database through to March 2023. Two independent reviewers filtered and screened papers.

Eligibility Criteria

Studies of all designs were included in this review to provide a comprehensive map of the existing evidence of the impact of HP bias of SES on clinical decision-making and its effect on the care for people with lower SES.

Data extraction and Synthesis

Data were gathered using an adapted JBI data extraction tool for systematic scoping reviews.

Results

Sixty-seven papers were included from 1975-2023. Thirty-five (73%) of included primary research studies reported an association between HP SES bias and decision-making. Thirteen (27%) of the included primary research studies did not find an association between HP SES bias and decision-making. Stereotyping and bias can adversely affect decision-making when the HP is fatigued or has high cognitive load. There is evidence of intersectionality which can have a powerful cumulative effect on HP assessment and subsequent decision-making. HP implicit bias may be mitigated through the assertiveness of the patient with low SES.

Conclusion

HP decision-making is at times influenced by non-medical factors for people of low SES, and assumptions are made based on implicit bias and stereotyping, which compound or exacerbate health inequalities. Research that focuses on decision-making when the HP has high cognitive load, would help the health community to better understand this potential influence.

Key Words

Socioeconomic Status, Implicit Bias, Unconscious Bias, Socioeconomic Disparities, Healthcare Disparities, Clinical Decision-making, Healthcare Professionals, Scoping Review.

Article Summary

Strengths and limitations

- This scoping review has a previously published protocol and has been conducted in line with international standards for best practice, to ensure rigor and transparency.
- The inclusion of a patient and public interest representative in the research team added quality to this review, by ensuring that the review is relevant, meaningful, and informed by the perspective of the people that access and utilise healthcare services.
- This work summarises the body of evidence in a clear concise manner, which highlights the patterns, advances, and gaps in what is known about this topic as well as the priorities for future research.
- Due to the nature of funding, only studies published in English were included and therefore this scoping review may have excluded relevant literature published in other languages.
- In keeping with the nature of a scoping review, the quality of literature collected was not evaluated.

Introduction

Socioeconomic status (SES), a social determinant of health, is a key causative and contributory factor to disparities and inequities in morbidity as well as mortality in many nations[1-3]. There is a wide range of robust empirical evidence from many settings which indicates that people with lower SES tend to have a shorter life expectancy and worse health related outcomes in comparison to more affluent people[1-4].People with higher socioeconomic status (SES) have better life chances, and thrive more than those in other socioeconomic groups[5-7]. The causes of the social gradient in health are complex, and the exact nature of the relationship is difficult to establish, because it is informed by both individual factors such as health behaviour but also factors associated with economic wealth[8-9]. The gradient in health and SES is also subject to a person's power, prestige, and the social connections they enhance[5]. Therefore, SES related healthcare disparities are influenced by how a person's SES is perceived by themselves and others[5,6].

There is evidence that suggests the care people receive is subject to Health Professionals (HPs) implicit bias arising from perceptions of patients with low SES[10]. Every person's thinking is shaped by lived experiences; interacting with people whose lived experience more closely reflects our own can lead people to using a favourable bias; just as unfavourable bias can be attributed to people whose life experience differs from one's own[11,12]. These biases are often subconscious or implicit and manifest in unthinking actions or ill-considered behaviours[11-15]. HPs are susceptible to multiple implicit biases relating to different characteristics such as SES, gender, weight, age, and ethnicity in their decision-making[11,12,16]. Implicit biases affect HPs decision-making about different aspects of patient care, such as diagnosis and treatment, often with deleterious consequences for the healthcare of that are minoritised, marginalised or othered[17]. HPs and patients hold implicit biases alike, which hinder the formation of a therapeutic healthcare relationship, patient experience, clinical decision-making, and care quality [9].

Operational Definitions

It is important to define key concepts at the onset of this work so that there is clarity about their use in this scoping review. Our operational definitions are summarised in figure 1 and are set out in detail with their underpinning rationale in our protocol for this scoping review[13].

Socioeconomic Status

SES is complex and challenging to define. Internationally, typically countries measure SES using Multiple Indices of Deprivation (sometimes called Multidimensions of Deprivation), which include economic factors such as income but also factors such as education, physical environment (sometimes known as neighbourhood quality), and health[13,18]. Papers will be included in this scoping review when the connection between SES of the patient (or one of its discrete measures, e.g., income, unemployment, education) and HP decisions is explored. There are some limitations to the use of discrete measures like income as proxies for SES, but it is prudent to include papers which include proxy measures of SES, as this is more likely to reflect the way healthcare professionals make decisions, as they encounter people in their practice[13,19]. In other words, we assert that healthcare professionals are more likely to use discrete measures of SES, rather than more robust empirical measures to inform their perceptions of patients in everyday practice[17]. Therefore, we contend that it is apposite to include papers with discrete measures that may be limited in their utility as proxy measures of SES in this scoping review, because they offer useful insights into factors relating to healthcare implicit SES related bias(es) and how they affect HPs decision making about different facets of patient care in the reality of everyday practice.

HP Biases and Patient Care

Several systematic and scoping reviews[12,16,20] have explored the impact of HPs cognitive and other biases on patient care. However, only two of these systematic reviews[16,20] have focused specifically on the HP implicit bias and its impact on clinical decision making as well as the consequences for the quality, safety, equity, and appropriateness of patient care.

FitzGerald and Hurst's systematic review[16] explored HPs implicit biases relating to race/ethnicity, age, gender and SES, and indicate that biases are likely to influence diagnosis, treatment decisions and levels of patient care. Fitzgerald and Hurst's review[16] discusses evidence that social class may invoke more salient bias than bias associated with other characteristics such as race. Beyer[20] explored factors that influence treatment decisions in localised kidney cancer and found that education and socioeconomic status, were identified as barriers to HP making equitable treatment decisions.

Willems et al.'s systematic review[12] focuses on the impact of SES on doctor-patient communication, however this review does not consider decision making. Willems et al[12] found that patients with lower SES had a less positive dialogue with their doctor, characterised by lower levels of information giving, less interactive discourse and a lower level of doctor advice/instruction.

Bias and Decision Making

Biases can be explicit, implicit, favourable, or unfavourable, but regardless of form, it is an impediment to judging others fairly, which undermines safe, just, and equitable healthcare[11,16,21-23]. Explicit bias occurs when the individual has conscious thoughts, beliefs, and awareness that they evaluate people differently based on their characteristics, these evaluations consciously influence their behaviours and decision making[8,9,11,24]. In contrast, implicit bias is subconscious, and the individual is unaware of its influence on how they affect, cognition, behaviours, and decision-making[24,25,26]. Consequently, there is a more deliberate, volitive, and intentional process to decision-making when explicit bias is at play in contrast to the tacit, covert, unintentional nature of the relationship between implicit bias and decision-making[11,16,23].

Implicit and explicit bias are kindred but independent constructs which raises some methodological challenges and considerations with regards to their measurement[13,21]. Explicit bias relates to thinking that people are aware of and so can be measured through self-report, but there is the risk of people providing socially desirable responses[21]. The subliminal nature of implicit bias requires a different approach to surface and measure it given its multifaceted impact on a person's affect, cognition and behaviour[21]. The Implicit Association Test (IAT) is the most established way of measuring implicit bias and has strong psychometric properties in comparison to other implicit measures[21,27-30]. Therefore, it is important to briefly consider its strengths and limitations.

Implicit Association Test

The (IAT) is a validated measure of implicit bias and with strong psychometric properties in comparison to other tools[30,31]. A consensus exists among researchers with regards to the IAT's lacks of a high test-retest reliability in the same individual[16]. However, the construct validity of the IAT, as well as its efficacy as a measure of implicit bias, especially as a predictor of real-life behaviour in the context of everyday life is contested[16,21,30,32]. Concerns relating to the predictive validity of the IAT persist among some researchers, progenitors cautioning against its use to forecast what people will do, or not do, and behave as they go about their lives, given the vicissitudes of human existence with their concomitant, contingent events that intersect in complex, unexpected, emergent ways to impact on an individual's affect, actions and behaviour[16,30]. Conversely, others[30,32] maintain that implicit and explicit measures of bias are not superfluous but have their merits in informing predictions about human behaviour in different ways that are distinct from each other. Despite this lively debate about the relative merits of IAT, it is most widely utilised measure of implicit race and ethnicity bias in healthcare[16,31,33]. One view is that there is

specious evidence of the predictive validity of the IAT with regards to implicit racial bias[30,34]. This characterisation of the IAT's utility in establishing implicit racial bias is strongly disputed by many others[30,35,36], who have a different understanding and conclusions predicated on the same data set. There is also evidence from a systematic review[37], which highlights the limitations of the IAT in establishing multiplicative effect of several biases that intersect across multiple social identities.

Our approach

A better understanding of the impact SES has on HP patient related decision-makings arguably will provide a valuable new focus in tackling socio-economic health inequalities[8,9,12]. Therefore, it is imperative to undertake a scoping review that maps all pertinent evidence, integrates contemporary knowledge about this topic, clarifies key concepts, sets out evidence-based recommendations for practice and identifies the priorities for future research. In our view, it is essential that the scoping review should map all available research on implicit SES related bias regardless of the research method used. Several scoping reviews[24,33,38] have highlighted the valuable insights into implicit bias and its impact on HPs decision-making that can be gained from studies that use other research methods such as case study vignettes, questionnaires, think aloud interviews, randomised controlled trials and qualitative methods. This evidence from other scoping reviews underscores the aptness of our decision to include all studies that met our inclusion criteria as stated in detail in our a-priori protocol[13], regardless of the methodological approach used. Debates about methodological rigour in relation to implicit bias should not be an impediment to use every means to better understand and address its pernicious impact on HPs clinical decision-making, often culminating in inappropriate or discriminatory care that gives rise to adverse event, causes harm, offence and negatively impact people's healthcare related outcomes. In sum, any scoping review that considers implicit bias in healthcare has an obligation to include all studies so the best possible relevant research evidence to inform and underpin the consistent delivery of safe high-quality, just, and equitable healthcare.

Aim

We sought to scope the reported impact of HP bias about SES on clinical decision-making and its effect on the care for people with lower SES in the wider literature. Our aim in this scoping review was to answer three related research questions:

- RQ1: What has been published about implicit SES bias and HP attitudes or behaviours when deciding and providing care?
- RQ2: How does SES effect the dynamics of the HP and patient relationship?
- RQ3: What recommendations for practice have been postulated, implemented, or evaluated to address HP implicit bias related to SES?

Method

We conducted a scoping review using JBI methodology[39,40] as set out in our a-priori published protocol[13], and report our results in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols and Scoping Reviews (PRISMA-ScR) guidelines[41,42]. A detailed account of methods used in this scoping review is provided in our a-priori published protocol[13], which has granular details about key elements such as the search strategy, inclusion/exclusion criteria which can be replicated. Therefore, we present a concise summary of the conduct of this scoping review in line with best practice reporting to avoid undue repetition.

Patient, Public Involvement

This scoping review [and it's previously published protocol] has been developed with a member of the public (BA). The design of this scoping review draws upon BA's personal experience of living with, and beyond a cancer diagnosis,

which entails regular contact with health services and healthcare professionals. Therefore, BA's lived experience and perspective has directly shaped the design, results, discussion and implication sections of this work.

Search strategy and data sources

Our literature search was carried out in three stages. In the first stage, an initial search was undertaken on Medline to identify and refine search terminology and consider Medical Subject Headings to ensure a comprehensive strategy that selected all the relevant papers published related to SES and its impact on health care. The Medline search strategy was tested, and the first 100 references scanned by three authors (AC, CJ, and RS) to ensure relevant papers were retrieved. Key papers were checked to confirm they were being retrieved by the search. In the second stage of the search process, the Medline search strategy was adapted for use on other key databases (Medline, Embase, ASSIA, Scopus, CINAHL) [see table 1] to account for differences in controlled vocabulary and database functionality. We also searched the website of key organisations such as professional regulatory bodies, think tanks and policy making bodies for any pertinent publications. In the final stage of the literature search, we conducted back and forward chaining of included papers to identify any other relevant documents. All searches have been updated since the initial search date, of 21st October 2021 and are up to date as of 9th March 2023. Please see Supplementary Materials 1 for the detailed search strategy.

Table 1: Table of Databases searched.

Date Restriction: None *The start date varies in each of the databases because these are the first available offered by each of the databases.	**Language Restriction:** English only
Database name	**Dates Covered* Up to March 9 2023**
Medline (OVID) & EPub & Medline in process (OVID)	1947 – present
Embase (OVID)	1946 – present
ASSIA (ProQuest)	inception – present
Scopus (Elsevier)	1960 – present
CINAHL (EBSCO)	1976 – present

Screening and selection process

All retrieved citations were exported to the Rayyan systematic review software package and duplicates removed. In the first filter, the titles, and abstracts of the included papers were assessed against the inclusion criteria and independently filtered by two members of the project team (CJ and RS). Any differences with regards to the inclusion or exclusion, were resolved through discussion and after reviewing the full text of the papers in question. In the second filter, the full text papers were assessed against the inclusion and exclusion criteria. Our inclusion criteria are set out in Table 2, as per our protocol[13]. We only included publications in English as this was an unfunded study with no facility for translation[13]. Studies of all designs were included in this review because our focus was on mapping the evidence about the impact of HP bias of SES on clinical decision-making and its effect on the care for people with lower SES.

Table 2: Identification the Population, Concept and Context and Design

Population	Concept	Context	Design
People aged 18+ globally	Socioeconomic Status (SES)	Health Professional bias or implicit/unconscious bias of SES when it interacts with decision-making.	Research studies of all designs that include primary data
	Papers that discuss a contributing factor of SES (such as education or income) as defined in the operational definitions.	Any healthcare setting where a person is assessed, and decisions are made by a Health Professional.	Case studies
	Please see the detailed search strategy in the supplementary material with the full list of search terms used in relation to SES.	Health professionals include: Doctors Nurses Physiotherapists Occupational therapists Speech and Language therapists Midwives	Editorials
			Opinion papers

Data extraction and charting

Relevant data were gathered using an adapted version of the JBI data extraction tool systematic scoping reviews[43], that was converted to an Access Database form (please see Supplementary Materials 2 for the adapted JBI data extraction form). This Access database form was tested on the first five papers and then adapted as per JBI guidance to gather all information pertinent to the review questions[43]. On completion of data extraction, the data was exported to an Excel spreadsheet to facilitate data analysis. Our mapping and reporting of the data was also informed by the lived experience and perspective of the patient and public interest representative on our team (BA) as stated in our protocol[13] and consistent with best practice in systematic reviews[44].

Results

Selection of sources of evidence

The PRISMA flow diagram below (Figure 2) summarises how we searched for relevant publications and selected literature for inclusion, in line with best practice in scoping reviews[45]. Data analysis, interpretation, and reporting will be underpinned by the PAGER framework[46].

Summary of characteristics

In our search strategy, we purposively cast a wide net to capture all relevant published papers, because of the complexity of defining SES and in total, we screened 11823 publications across different decades. At first filter, 11281 'off topic' papers were excluded, such as those concerned with children, dentistry, HP career development or focused on SES but not HP decision-making. We selected publications that considered HP decision-making from the HP's viewpoint and excluded papers that explored HP decision-making from the patient perspective.

We reviewed 542 studies for eligibility and retained 67 publications for inclusion in the scoping review. The characteristics of the publications included in this scoping review are presented in a Supplementary Materials 3 called 'Characteristics of Included Publications'. Seventy papers were retained for background reading and synthesis, because they provided broader insights about the relationship(s) between stereotyping, bias, and SES. We included a wide range of publications in this review. Forty-eight of the 67 included papers (72%) reported on original research, while the remaining papers were commentaries or opinion pieces (n=15) and reviews (n=4) about aspects of SES and HP decision-making. Most included papers, were from the United States of America (67%; n= 45), followed by the United Kingdom (10%; n=7), Canada (6%; n=4) and Portugal (3%; n=2). Two papers involved authorship across national boundaries, and these were labelled as international (3%; n=2). The remaining included papers included involved a single published paper from Denmark, Finland, Mexico, New Zealand, Norway, Sweden, and Pakistan.

The earliest published included research paper retained was by Crane[47] in 1975, who explored the impact of social factors and physiological criteria in HP treatment decisions about critically ill patients. Crane[47] explored doctor decision-making using case histories and questionnaires; she discovered that there were disparities in doctors' decision-making between a patient with a high-status occupation and another patient described as an unemployed labourer. Doctors in this study[47] offered more aggressive treatment options to people with high status occupations, even though they explicitly stated that they did not rate social status highly in their decision-making process. Crane[47] did not categorise this finding as implicit bias, which may reflect the prevailing socio-cultural beliefs at the time this study was conducted. However, in our view, this finding by Crane[47] is an example of implicit bias and the earliest research study we found. We also noted that from 2008 onwards, there was at least one publication about bias in relation to SES that met the inclusion criteria for this review. The increased frequency of publications from 2008 onward maybe a consequence of the emergence of the Fundamental Causes Theory[3] and a greater understanding of socioeconomic disparities in English healthcare provision facilitated by the Marmot Review[1].

Types of publications

The results of this scoping review highlighted various aspects of what has been published about implicit SES bias and HP attitudes or behaviours when deciding and providing care. Firstly, most of the 67 publications included in this scoping review were original research studies (n=48, 72%), with the remainder being reviews, commentaries, and opinion papers (n=19, 28%). This indicates that there has been a greater focus on building the evidence on this topic by focusing on conducting primary research relative to preparing other types of papers which provide useful and complementary insights. An alternative perspective to consider is that publications such as commentaries, opinion papers, and editorials often contain useful tacit insights and wisdom that constitute *'fugitive knowledge'* or *'soft intelligence'* as they exist beyond formal knowledge structures, because this information is risky to know and share with others through conventional mechanisms[48,49]. Therefore, these valuable insights are challenging to establish and understand using conventional research approaches. So, they may be scope to encourage the publication of different types of papers on this topic to facilitate a better understanding of how the SES related perceptions, views, or beliefs of a HP impact on their clinical decision-making in a manner that reflects the reality of healthcare which is delivered in complex adaptive systems.

Geographical location

Many of the papers in this scoping review were authored by people based in the global north, specifically North America and Europe from 1995 onward (n=61, 91%), with the remainder being written by an international team of authors or people based in other parts of the world. This may be an indication of the impact that seminal publications such as the Fundamental Causes Theory[3] and Marmot Review[1] have had in highlighting the relationship between lower SES, health inequalities and poor health related outcomes in these parts of the world. It is also possible that the higher number of publications in these regions may reflect that there is greater scope to access funding for research on the relationship between implicit SES bias and HP's clinical decision-making within these settings. Then, it would be apt for more multinational research on the relationship between implicit SES bias and HP's clinical decision-making within especially those that are low and middle income, or described as developing and transitional, so there is a better understanding of this issue across nations especially those that are in the global south.

Health Professionals

Thirty-one[9,18,19,25,28,47,50-74] of the forty-eight research papers reported on implicit bias in relation to Doctor/Physician clinical practice. The remaining papers explored or discussed decision-making from a multi-professional viewpoint (n=6)[75-80] and this included doctors, nurses or midwives working in multidisciplinary teams. Four research papers[29,81-83] explored nurse bias and decision-making, four involved medical students[27,84-86] and two papers[87,88] explored potential bias and decision-making of Psychotherapists/Counsellors. One study[89] was concerned with Occupational Therapists. The implicit bias in nurses and allied health professionals' practice is more evident in recent research studies which may reflects their increasingly central role in clinical healthcare decision-making. We found no studies that explored implicit bias in Pharmacists' decision making. This was a surprise as clinical decision-making is a fundamental aspect of pharmaceutical practice especially in settings such as the UK, where pharmacists have extended roles as non-medical prescribers and must be able to assess, diagnose, and treat patients[90,91,92,93].

Research Methods

Included primary research papers employed several different methodological approaches. Most research papers (50%, n=24) used a vignette approach[19,25,27-29,44,47,51,53,54,57,60,64,67,68,71,72,79,82-84,86,88,89], and some combined the vignette approach with the Implicit Association Test (n=6)[27-29,67,68,72]. Some studies used prospective data collection (n=2)[29,80], High Fidelity simulation (n=1)[85], retrospective data review (n=3)[62,69,78] quantitative survey/questionnaire (n=8)[9,47,56,61,66,68,81,87], qualitative interview (n=10)[52,55,58,63-65,70,75-77], or a qualitative observational approach (n=2)[65,76].

Vignette studies illustrated the clinical scenario through a video recording (n=11)[19,25,44,51,53,64,71,79,82,83,88] while others used a combination of written case examples and written scenarios with pictures depicting the clinical cases (n=13)[27-29,47,54,57,60,67,68,72,84,86,89] Representations of SES were indicated based on appearance of the patient, such as how they dressed and/or the description of the person which indicated their occupation. In studies that retrospectively or prospectively examined health data, health insurance status, or area level deprivation measures were applied to patient demographic information to measure the SES of the population.

SES and HP Decision-making

Thirty-five of the forty-eight included primary research studies (73%) reported an association between SES and HP decision-making[9,18,19,47,51,52,54-58,60,62-66,68-73,76,77-79,81,82,83-87]. Meaning that in over two-thirds of the research papers reviewed HP decision-making about assessment, investigations, treatment, or care was influenced by a person's socioeconomic status. Thirteen papers did not detect any SES related bias in HP decision-making[25,27-29,44,53,59,61,67,74,80,88,89]. There were no discernible patterns or trends in the characteristics of these 13 papers, which

used a variety of methodologies, involved different HPs across a range of specialty settings. Interestingly, four papers by Haider et al.[27-29,67] did not find a link between SES and decision-making, but detected high levels of implicit favourable bias towards people with high SES, in doctors[28,67], nurses[29] and medical students[27]. All these studies[27-29,67] combined the Implicit Association Test (IAT) and a vignette-based approach to assess the impact of implicit bias on decision-making. Three of these studies reported that 90.7% of doctors (n=215)[28], 93% of nurses (n=245)[29] and 86% of medical students (n=211)[27] demonstrated an implicit preference toward people with High SES. However, in these studies[27-29], the high levels of implicit SES bias were not evident in HP's decision-making. This result suggests that not all implicit bias leads to disparities in decision-making.

Table four below displays the research that links SES and decision-making by professional group. Three quarters of the research papers demonstrate a link between SES and decision-making in doctors (n=23)[9,18,19,47, 51,52,54-58,60,62-66,68-73], medical students (n=3)[84-86] and nurses (n=3)[81-83]. Five of the six studies with multi-professional participants demonstrated a link between SES and decision-making (n=5)[75-79]. There was not enough data within the included studies that focused on Occupational Therapists and Psychological Therapists, to draw any meaningful conclusions about the relationship between implicit SES bias, and their decision-making (Table 3).

Table 3: Link between SES and HP decision-making per professional group (research papers)

Professional Group	Link found	link found %	No link found	No link found %	Grand Total
Doctor	n=23	74%	n=8	26%	n=31
Medical student	n=3	75%	n=1	25%	n=4
Multi-professional	n=5	83%	n=1	17%	n=6
Nurse	n=3	75%	n=1	25%	n=4
Occupational Therapist	n=0	0%	n=1	0%	n=1
Psychological Therapist	n=1	50%	n=1	50%	n=2
Grand Total	n=35	73%	n=13	27%	n=48

In our included research publications, we identified that there were some medical specialities in which there were three or more research studies exploring SES related implicit bias in HP decision-making (see Table 4). Every included study (n=7; 100%) on pain assessment and/or management[60,71,72,79,81-83] reported a link between decision-making and SES. In obstetric/contraception care 80% (n=4) reported a link between implicit SES bias and HP decision-making[62,75-77]. More than three quarters of the studies involving cancer care (n=6; 86%)[19,51,57,69,70,84] and all but one study (n=7; 87.5%)[9,18,55,56,68,78,85] exploring coronary heart disease (CHD) detected disparities in HP decision-making related to SES. Three of the nine papers that explored multiple conditions detected a link between SES and decision-making[58,65,66]. Two of the included research papers on diabetes[64,65] and one in mental health[87] found a link between SES and decision-making. The two studies exploring SES and decision-making in trauma care did not detect a link between SES and decision-making[28,67]. For the other specialities listed in table five a single research paper was included; asthma[73], dermatology[63], kidney transplantation[52], palliative care[47] and sickle cell disease[86].

Table 4: Link between SES and HP decision-making per specialty (research papers)

Condition	Link Found	Link Found %	No Link found	No Link Found %	Total
Cancer Care	n=6	86%	n=1	14%	n=7
Multiple Conditions	n=3	38%	n=6	62%	n=9
Coronary Heart Disease	n=7	86%	n=1	14%	n=8
Pain Assess/Management	n=7	100%	n=0	0%	n=7
Obstetrics/Contraception	n=4	80%	n=1	20%	n=5
Diabetes	n=2	67%	n=1	33%	n=3
Mental Health	n=1	50%	n=1	50%	n=2
Trauma	n=0	0%	n=2	100%	n=2
Asthma	n=1	100%	n=0	0%	n=1
Dermatology	n=1	100%	n=0	0%	n=1
Kidney Transplantation	n=1	100%	n=0	0%	n=1
Palliative Care	n=1	100%	n=0	0%	n=1
Sickle Cell Disease	n=1	100%	n=0	0%	n=1
Total	35	-	13	-	48

Discussion

As far as we are aware, this scoping review is the first to scope wider literature about the reported impact of HP SES related bias on clinical decision-making, through a comprehensive and systematic search of all the available evidence. This pioneering scoping review has generated key insights into what has been published about HP implicit SES bias, and how it affects HPs attitudes or behaviours as they make decisions about the provision of care for patients. In addition, this scoping review has also revealed how SES can affect the interpersonal dynamics of the HP and patient/service user in their relationship during care delivery. This scoping review has identified strategies, techniques, and recommendations that have been postulated, implemented and/or evaluated to address implicit SES bias in HP clinical decision-making. The insights that have been generated from the scoping review can be used to inform efforts to ensure that everyone receives safe high-quality, person-centred, evidence-based care in a just and equitable manner from every HP that they encounter. We begin our discussion by focusing on the salient points from the results relating to HPs, research methods and measures of SES. This progresses into a tightly focussed discussion of our results aligned to each research question in relation to wider literature.

Types of HP

It is worth noting that just under two thirds (n=31)[9,18,19,25,28,47,50-74] of research papers on HP SES implicit bias and decision-making focused on doctors/physicians, with significantly less studies focusing on interprofessional or multidisciplinary teams (n=6)[75-80], nurses (n=4) [29,81-83], and medical students (n=4) [27,84-86]. The number of papers exploring decisions made by non-medical HPs gains interest in the literature after 2008 and reflects the changing landscape of healthcare decision-making, and the extended role of Nurses and Allied HPs. The lower number of research papers exploring decisions made by non-medical HPs may also be an indication of the perceived importance of different healthcare professionals in patient care by those who fund research. The empirical evidence at hand indicates that more is known about doctors/physicians' implicit SES biases and its consequences with regards to their decision-making than other professions. Given the global shift toward more plural approaches to healthcare delivery in which other HPs have extended roles, such as non-medical prescribing, there needs to be greater focus in future research that explores any link between SES and decision-making of other professionals in healthcare and its consequences for patient care.

Research Methods

Our results indicate that the association between HP implicit SES bias and their decision-making has been examined using a variety of different research methods. However, half of the studies (50%; n=24)[19,25,27,29,44,47,51,53,54,57,60,64,67,68,71,72,79,82-84,86,88,89] utilised a vignette approach which used a video recording, or combined written case exemplars, scenarios, and images of different types of people. Some studies (n=6)[27-29,67,68,72] used the Implicit Association Test (IAT) to gather data regarding the participants' favourable bias as a precursor to vignette examination of decision-making. Regardless of the research method used, in most studies, the information provided to the participants with regards to SES was predicated on the patient's visual appearance such as the clothes that they were wearing, or how they were described which provided an insight into their profession, and or education.

Given the preponderance of vignetted based research on this topic, it is prudent to consider its utility in understanding HP decision-making. Vignette studies are adept at establishing judgement and decision-making in a variety of professions, which have a high level of applicability and generalisability about how HPs undertake their work on a day to day basis[94-95]. In addition, vignette studies are an effective way of exploring people's beliefs, perceptions, attitudes, behaviour, and biases[95-98]. However, the utility of this approach in decision-making studies is contingent on the researcher's ability to craft and word a written or visual vignette that reflects the complex nature of reality, and that sets out key information in line with best scientific practice[94-96,99]. A key issue with the use of vignettes in research is that the information that they contain and convey, may subconsciously relay, or reflect the researchers' own perspectives and/or biases, which may influence the information they provide, as well as how they describe others in the scenarios that they create. Hence, it is widely recommended that the vignettes are evidence-based, reviewed by expert peers, or patients, and subsequently pilot tested to ensure that they are valid, culturally appropriate, and clear before they are used in a study[94,96,100]. Equally, others[101] have opted to co-create vignettes with members of the population they research to ensure that they are culturally relevant, utilise the appropriate terms, and convey the perspective(s) of the people who are being characterised therein.
There is scope for the greater use of other research approaches such as high-fidelity simulation, prospective data collection, qualitative interviews, qualitative observation, quantitative surveys or questionnaires, and retrospective data reviews in studies on this topic. Conducting future research which uses some of these less commonly used approaches, on their own or in combination may shed new light on hitherto unknown or overlooked aspects of HP implicit SES related bias. This is particularly important as each research method has its own strengths and weaknesses, so using a combination of different approaches facilitates data triangulation, which can lead to more meaningful insights, enhance methodological rigour, and help to draw more robust conclusions from the data.

Measures of SES

When developing the protocol for this study we made the decision to include poxy measures of SES and in retrospect this was an important decision. When exploring HP decision-making a number of proxy measures or indicators of SES have been utilised in the included research papers. Included papers used poxy measures such as occupation/Employment (n=15)[25,27,29,47,53-55,65,68,71,72,81,84,85,89], Education (n=14)[9,28,52,58,59,61-63,70,78-80,82,89], Income/Finances (n=11)[9,18,57,69,71,72,74-76,78,80], appearance/dress (n=7)[19,25,53,64,83,85,88], Health Insurance (n=3)[18,19,56]. A Formal SES or deprivation measure was used in only three of the studies included in this review[9,66,69]. We are aware that the inclusion of papers with single discrete measures such as these may be contested from a social science perspective, as SES is invariably multifaceted and complex[17]. A comprehensive discussion about the utility or otherwise of different discrete or proxy measures is beyond the remit of this paper, but there are some constraints to the use of some discrete measures such as income as a proxy for SES. The results of this scoping review support our view that proxy measures for SES, albeit with their limitations, can provide useful insights into HP implicit bias and its consequences for their clinical decision-making about patient care[17]. Therefore, by mapping the different methods that are used to measure and report SES in different types of publications, it is hoped that there is a clear overview of how they have been utilised in different contexts.

RQ1: Bias and Stereotyping

HPs make different judgements or decisions about assessment, treatment and care based on who the patient is, as opposed to what they present with[64]. Three examples of this are highlighted below drawing on the evidence pertaining to pain assessment/management, maternity/contraception care and cardiac care. Wilson[81], Anastas[72], and Brandao et al.'s[82] studies highlight stereotyping as an influence in HP behaviour and decision-making. Brandao[82] reported that people with low SES were viewed as less credible during pain assessment by a HP. Anastas[72] and Wilson's[81] studies both found that people with low SES were often viewed as being untrustworthy and incapable during pain assessment, which led to disproportionate concerns about possible opioid addiction and triggered 'gate keeping' behaviours in the HP and this affected pain management decisions. Stereotyping and bias were also reported in maternity and family planning studies[65,76,77]. Manzer[77], Smith-Oka[76]and Shawahna's [65] studies identified the adverse impact of stereotyping on HPs assessment and decision-making. In these studies HPs considered women with low SES to be untrustworthy, bad mothers and/or promiscuous, as well as lacking capacity to make sensible decisions about planning future pregnancies[65,77,76]. Manzer[77], Smith-Oka[76] and Shawahna[65] studies also reported that women with low SES were subject to biased disparities in advice, guidance, and management that nudged women toward using longer term (and on occasions irreversible) contraceptive options. Agerstrom et al[78] found that people with low SES were more likely to receive delays in cardiac arrest care compared to patients with higher SES. In this study[78], the results revealed that highly educated patients (P <0.001) and patients with higher income (P = 0.001) were significantly more likely to have their heart rhythm monitored prior to the onset of the cardiac arrest (holding all other variables). Heart rhythm monitoring was significantly associated with less delay, shorter duration, increased immediate survival and 30-day survival[78]. In this instance, SES related discrimination was associated with HP decision-making about who gets cardiac monitoring, which impacted on timely cardiac arrest care and patient survival. Goddu et al.'s[86] study highlights that perceptions and stereotyping amongst HPs can be triggered prior of in-person meetings with patients through language and words used in medical records or referral letters. This suggests that SES related stigma and bias can unwittingly be transmitted among HPs through the words and language that are used to characterise the person receiving care as well as to describe their lived experience. Therefore, the words, terminology, and language in reference to the people seeking or receiving care seem to be a key influence and, in some cases, a predeterminant of HP attitudes and behaviour that can adversely affect clinical outcomes.

Social psychologists describe two fundamental dimensions of social perception when considering bias and stereotyping that help us to understand how people see each other[102]. The stereotype content model (SCM) was first proposed by Fiske[103,104] and provides a theory that explains how individuals form impressions, assumptions, and judgements of other individuals or groups based on their perceived warmth or capability. This theory is useful when making sense of the biases that might be impacting on HP interaction with patients and when making decisions [102]. The first dimension of the SCM relates to the **warmth** of a person, for example, how friendly or trustworthy they appear to be[103]. A person who is cooperative is deemed warm, and a person who is perceived as resistant is perceived as cold[104]. The second dimension relates to the **capability** of the person, for example, how skilled, intelligent, or competent they appear[103,104]. Warmth is evaluated first because it predicts future behaviour; capability is judged more slowly as it reflects the other person's ability to act competently[26]. In terms of SES or social class, for example, wealthier people are stereotyped as intelligent and better educated, therefore more capable than poorer people of lower SES or class[26]. SES can be signalled in many ways, the way a person dresses, their mannerisms or their accent, and these cues lead to behaviour changes that impact on the interaction between people[26]. The interaction between people is a dynamic process in the context of healthcare, so HPs make conscious and subconscious judgements about the other person, while simultaneously, the person seeking, or receiving healthcare makes similar judgements about the HP, this is then manifest through dialogue and influences how they see each other. Stereotypes do not need to be consciously recognised to generate discrimination, they can be subconsciously held, and triggered in such a way that people use them to frame their actions and to rationalise what they do, or do not do, in an automatic process with little or no thought or self-awareness[105]. Consequently, SES

related stereotypes seem to be a contributing factor that maintain health inequalities, given that HP decision-making appears to lead to unwarranted variations in care and treatment[64].

Time and cognitive load

A recurring theme is the reported influence of HP workload on implicit bias and decision-making. There is evidence to suggest that HPs rely on implicit messages to 'fill the gaps' in comprehensive assessment when time and effortful thought are limited or prevented. Several papers[11,75,106,107] suggest that the contribution of cognitive load, stress and limited time-restraints impact on the HP's motivation to suppress implicit bias when making decisions. Self-awareness of one's own prejudice and bias is important when making decisions, but self-awareness is diminished when the HP is busy and does not have sufficient head space to mitigate the impact of potential implicit bias[108]. Decision-making is ideally a controlled process which involves making intentional, conscious, and effortful thought[108]. However, if the HP is engaged in high levels of mental activity, is stressed or has limited time, then this can interrupt, impair or prevent a controlled thoughtful decision[108]. In these circumstances stereotyping is used as an energy saving mechanism that allows for intellectual shortcuts in decision-making that feel comfortable because they fit with what we think we know[11]. Therefore, HPs are less patient-centred in these circumstances and the unique features of the patient (which are discovered during comprehensive assessment) can be replaced with stereotypical patterns based on the patient belonging to a certain social group/s[11,107,108]. Brown[75] discovered that HPs took greater effort to ensure the confidentiality of the HIV diagnosis was protected for women with high SES. The HPs in the Brown study[75] considered confidentiality to be less of a priority for the women with low SES because their social position was less important. Brown[75] discovered that this bias tended to be activated when staff were overburdened and/or where health services were poorly resourced. There is also evidence that shows stereotyping can assist in coping with the pressures of HP practice[109]. Spending less time with patients with low SES may be perceived as helping to 'move clinics along,' because of the HP assumption that some people will not need as long as other people in clinic. Patients with low levels of SES, can often be viewed as needing less information because of an assumption they do not wish to be informed, because they ask less questions or because they do not have the capacity to retain information, and this assumption actually helps the clinic to regain lost time[109].

Intersectionality of SES and other factors

Intersectionality refers to the interactivity of different social identity structures such as race, class and gender, and how belonging to more than one social identity group can have a greater negative effect than belonging to one group alone[16,110]. Our results show that intersectionality can have a powerful cumulative effect on HP assessment and subsequent decision-making. Stereotypes and prejudices are stackable and the proclivity towards discriminatory attitudes, tendencies, and behaviours rises as perceived vulnerability of the person seeking or receiving care increases[16]. Denburg et al[57] explored race and social vulnerability for men with localised prostate cancer and discovered that the higher the perceived patient vulnerability by the HP, the more likely they were to opt for 'watchful waiting' as opposed to active treatment. For example, men who were deemed to have a low income, were widowed, or were characterised as being black by HPs, were the least likely to be referred for radical prostatectomy. McKinlay[18] explored non-medical influences on HP decision-making for patients with coronary heart disease and found that discriminatory attitudes and behaviours were linked to the patient's age, perceived level of income, and insurance status. Older adults with low income and without medical insurance were less likely to receive a primary cardiac diagnosis, however this discrimination did not affect younger patients who were low income and without insurance[18]. Fitzgerald's[16] systematic review which explored implicit bias in healthcare professionals, highlighted how perceptions relating to race, SES, and gender intersect, but also interact in complex ways. The intersectional interaction between different factors is arguably a reflection of the continuous nature of perceived warmth and capability matrix as previously described in the SCM, but the outcome for the patient can be bleaker when racial and class biases stereotypes overlap[26]. Our results about the complex intersection of SES and other factors such as race

are consistent with wider evidence from other studies. For example, there is evidence which shows that controlling for SES, people who are of Afro-Caribbean heritage are three times more likely to be diagnosed with diabetes than their counterparts of European heritage, while people who are Lesbian, Gay, Bisexual, Transgender or identify as Queer are more likely to have multiple risk for cardiovascular disease than their heterosexual peers[4]. The evidence collected on intersectionality in this review demonstrates the importance of multivariable reviews of implicit bias, therefore exploring SES, race, age, or gender as individual factors in isolation will not tell the whole story. Instead, the intersectionality the distinctive characteristics, and traits that a person has as well as the social groupings that they belong to must be considered, especially given their complex interactions and cumulative effect on the care of patients is the correct way forward when we seek to understand patient experience.

RQ2 SES and HP Decision-making

Dialogue plays a key role in how we see each other[111]. Initial impressions of both the HP and patient can be corrected through interaction between both parties[112]. Initial impressions of warmth and competence can be adjusted through dialogue during the assessment and decision-making process. This interaction however requires motivation for one or other party[51]. A motivated HP who offers more time, seeks the input of the patient, and consciously considers equality and/or equity can build a dialogue with the person based on 'what matters most to them'[103]. In the same way a patient who demonstrates existing knowledge and has an active or assertive manner in dialogue with the HP can influence the HP decision-making by altering the HPs assumptions related to the warmth or competence of the patient[51].

Manderbacka[55] exploration of decision-making in relation to 'white collar' and 'blue collar' patients found that doctors were more likely to take a 'doctor-centred model' for communication, assessment and decision-making with patients from a 'blue collar' background, but tended to adopt a 'person-centred and shared decision-making model' with 'white collar' background patients. It is not always the case that a person who is inferred as capable is automatically also perceived as warm on the SCM matrix[113], in fact some research has shown that when a person is viewed as capable and competent then the perception of warmth is viewed less positively[102,103,113]. This can mean that when a patient is perceived as lacking capability or competence then their warmth can be viewed more positively as a compensatory effect, which in turn triggers a greater paternalistic behaviour from the HP, that effects their communication style and quality[113]. Castaneda-Guarderas et al[114] and Krupat et al[51] assert that the perceived power differential between the HP and the patient can inhibit shared decision-making because it negatively effects patient trust[114]. Patients are less likely to participate in dialogue and shared decision-making if they perceive the HP as judgemental, in this way HP bias can trigger the patient's bias in a dynamic way, adversely affecting dialogue and patient centred care[51].

Patient assertiveness can lead to more careful diagnostic testing for people who may have been otherwise disadvantaged because of their SES (56). Barnhart et al[56] explored non-medical reasons for disparities in coronary heart disease treatments and discovered that if patients with low SES adopted a health assertive manner, then their treatment recommendations (revascularisation) more closely mirrored patients who had high SES. Krupat et al[51] explored the effect of patient assertiveness in HP decision-making for older adults with breast cancer and similarly discovered that patients with low SES were more likely to have full staging of their cancer investigated when they made assertive requests. In both these studies[51,56] patient assertiveness led to more careful diagnostic testing for people who may have been otherwise disadvantaged because of their SES. Therefore, there is empirical evidence which suggests that implicit SES bias can manifest itself in HP-patient behaviours that impede relationship building, which could be mitigated with greater HP self-awareness and greater patient assertiveness[51,56,111]. Further research is needed to explore the impact of patient assertive requests on HP decision making. It is increasingly recognised any such improvement efforts that seek to address health inequalities, such as those caused by HPs implicit SES bias, must involve meaningful co-production and dialogue about health inequalities that enables and empowers people to have agency and to take action[115].

RQ3 Measures to address HP implicit bias related to SES.

We integrated a range of recommendations from included publications into three main themes: further research, education/training and policy, and guidelines. The reviewed papers highlight the need for further research to explore in more detail the reasons and mechanisms in which social factors affect and influence HP decision-making[54,55,59,61,63,69,72,73,82]. There is a gap in understanding mechanisms that prevent or inhibit the implicit judgment surfacing as explicit actions, particularly related to HP time and cognitive load[61,108]. Hence, this gap in understanding is a key priority for any future research and improvement efforts that seek to address HPs SES related decision-making and its negative impact on patient care.

Another recommendation arising from the reviewed papers is the exploration of education and training for both HPs and patient groups which seeks to increase HP self-awareness through perspective taking and/or help patients with health literacy and assertiveness[9,51,56,60,68,70,71,76,77,82,84,85]. There appears to be a gap in the evidence that requires further exploration, specifically, there are as yet unanswered questions about how training can successfully raise awareness of SES bias, and how the impact of this training on clinical practice can be assessed or evaluated in the short term and longer term[116]. The impact of health literacy education on SES related bias is outside of this scoping review, but moving forward, it would be prudent to consider how health literacy and assertiveness education with patients might help facilitate more active participation for patients with low SES, which may have a role in reducing health inequalities[56].

Policies, guidelines, and best practice statements, which recognise the impact of SES on HP decision-making are needed to guide the HP when making decisions that inevitably include non-medical factors[58,70,75]. A smaller number of papers recommend that any such policies, guidelines, and best practice statements should be constructed with mindfulness of implicit bias[75,117]. Implicit bias needs to be explicitly discussed and integrated into the policy and guidelines that help to shape HP interactions and patient experience. There is evidence of this work is happening to help support people of global majority heritage who are minoritised because they are categorised as non-white[118]. This work must be expanded to include SES related bias, given its pervasive nature, as well as its complex interaction and intersection with race in relation to patient care.

Strengths and limitations

This scoping review has its limitations which must be given consideration. Most included publications are from North America and Europe in the global north, therefore the relevance of its results to other parts of the world, especially those that are part of what is increasingly referred to as the global south is limited. The fact that only articles published in English were included, means that relevant works in other languages will have been omitted from this review. Consequently, the result of this scoping review provided a limited insight into other parts of the world, particularly those where English is not the native language, as well as in places where the organisation and delivery of healthcare takes place in systems that are distinct from those in North America and/or Europe. Conversely, the inclusion of research studies and other types of publications broadened the depth and breadth of this review. There was no critical appraisal or quality assessment of the included research studies, which is in keeping with JBI scoping review methodology[39,40], and was apt; the focus was on mapping the literature on this topic. Drawing upon our diverse range of skills as patient and public interest representative (BA), a Librarian/Information Technologist (AC), and three HP academics (CJ, PG, RS), we reached a consensus on how best to convey the results to others in plain English, a series of recommendations for implementation in practice, as well as the priorities for future research.

Implications for Practice and Policy

A key message arising from this scoping review for health services, professional bodies, and policy makers is that HP's have SES related implicit biases that influence how they organise and deliver patient care. HP decision-making is

also subject to non-medical factors, as assumptions are often made about the care of people of low SES based on bias and stereotyping, which causes, or exacerbates health inequalities that can adversely affect patient's clinical outcomes[64]. It is important that we remain mindful that some people do not receive equitable care, so there is a responsibility for all HPs to do what they can to be better informed about their own practice in relation to equity, and to do what they can to address this issue. Heffernan[116] contends that people can find it unpalatable when they are confronted with evidence that challenges their firmly held big ideas, such as HPs who believe that they do no harm and always seek to do good, being informed that their implicit SES related biases may have deleterious impact on the quality, safety, and equity, of patient care. It is always tempting for people to elide inconvenient truths or unpalatable facts because if they are accepted, then the individual is compelled to deal with things in a different way or to address gaps in their knowledge, attitude, skills, and behaviour, which is nearly always challenging. Turning a blind eye to biases can feel safe for an individual HP, but it is morally untenable as it contravenes the values that underpin healthcare and increasing the likelihood of people who are vulnerable, marginalised, silenced, and/or overlooked by wider society enduring unwarranted variations in care, receiving suboptimal care that is delivered in an iniquitous and unjust manner.

It is challenging for anyone to be truly objective and self-critical about their clinical practice, especially with regards to implicit bias which is tacit and often reflects normalised patterns of thinking and behaviour. In other words, everyone has a rationale or vocabulary of motive, for what they do or do not do, which means that it is challenging for anyone to accept that they have implicit biases, which are often contrary to the way a person thinks about themselves and their behaviour towards others. On the other hand, genuine changes in behaviour and improvement in any human endeavour can only arise when there is a genuine acceptance of truth of the situation, specifically facts and issues at hand, including any implicit biases, with a concomitant theory of action[119]. As challenging as this may be, it is important to bear in mind that a transformation programme of action, especially in terms of improvement, requires a willingness to confront and examine all possible truths by asking searching questions, in this case about the organisation and delivery of healthcare. This sentiment is summed up in the view that not 'knowing something' is understandable because we are human, provided that the person is not turning a blind eye because they 'don't want to know'[116].

Health inequalities only endure because of a lack of insight or willingness to address social injustice, social indifference, an ideological stance of a vacuum of leadership[115]. Given what this scoping review has surfaced about the potential impact of implicit SES related HP bias greater consideration is needed about how the results can inform efforts to reduce health inequalities. It is also important to concede that HPs implicit biases often mirror those of wider society at any given point in time, because their values, beliefs, attitude, outlook, and world view will be tempered and influenced by the communities that they belong to and the wider culture that they inhabit. However, HPs are held to a higher moral standard than other members of society because of who they are and what they do, which comes with the requirement and expectation for them to treat all that they come across in an equitable, just manner with dignity and respect. Social status is linked to power, so for people of low SES, there is often a power differential between HP's and themselves[3]. Bias is dynamic; therefore, the HP-patient interaction can reinforce perceptions and judgemental attitudes that further embed prejudice or stereotypes. Our results suggest that healthcare commissioners, educators and regulators should embed measures to mitigate HPs implicit SES related bias through policy, guidelines, or best practice statements. Healthcare commissioners, policy makers, educators, and regulatory bodies would also do well to ensure that everyone involved on the organisation and delivery of healthcare, especially HPs know that implicit SES related bias increases the risk of the most vulnerable people in society. Simply put, implicit SES related bias by HPs tends to result in people who are the most vulnerable receiving the worst care, which has a harmful impact on their wellbeing, health related outcomes and life expectancy. Given the reality of praxis in healthcare within complex adaptive systems, normalising the practice of HPs taking a brief intermission, when it is clinical safe and appropriate, to be self-aware and to seek a broader perspective, especially when they are under pressure or have a high cognitive load may help to overcome the impact of implicit bias on decision-making. Whatever view one adopts in relation to the issues raised by the results of this scoping review,

more research is needed to ensure that healthcare policy and practice are evidence-based in relation to HPs implicit SES related bias.

Conclusion

This scoping review explored different aspects of SES related implicit bias and HP decision-making. Research in this area has grown and evolved significantly and the disciplinary focus has recently shifted from doctors to the wider healthcare team. While there remains limited understanding about the circumstances in which implicit bias is most likely to appear, some evidence suggests that this might be related to the HP's cognitive load, as time pressures can diminish self-awareness.

This review indicates that HPs often hold implicit bias of people with low SES, which can result in stereotyping and may compound or exacerbate health inequalities. It is therefore important to consider mechanisms to reduce the impact of this bias on HP decision-making. Greater awareness of the nature and potential impact of HPs implicit SES related bias and on patient care is urgently needed, as the bias associated with SES can make vulnerable people more vulnerable and may adversely affect clinical outcomes.

Research that focuses on HP decision-making, the influence of non-medical factors, and the impact of limited time/high cognitive load, would therefore help the health community to develop evidence based interventions to mitigate HP bias. Real world solutions, which go beyond education, to identify appropriate approaches to HP decision making, are needed, to ensure decisions are equitable.

Our review highlights the need for relevant research to underpin related healthcare policy and practice. Based on the review, we have identified three pertinent research questions that should be prioritised in future work in this area:

1. Does cognitive load reduce self-awareness of SES implicit bias and impact on the decision-making of the HP?
2. What are the best conditions to support shared decision-making with people who have low SES?
3. What training do HPs need to raise their self-awareness of implicit SES related bias and reduce its impact on their decision-making?

Figure legend Caption

Figure 1: Prisma Flow Diagram

Author Contributions

CJ, RS, PG, AC and BA discussed and refined ideas regarding the search strategy. AC developed the search strategy and conduced the database searches. CJ and RS extracted data and drafted the results . CJ is lead author and guarantor. CJ, RS and PG discussed and drafted the discussion of the paper with contribution from AC and BA.

Conflict of Interest Statement

None of the people listed below declare any conflict of interest which may arise from being named as an author on this manuscript.

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No additional data available.

Ethics Approval Statement

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Figure legend Caption

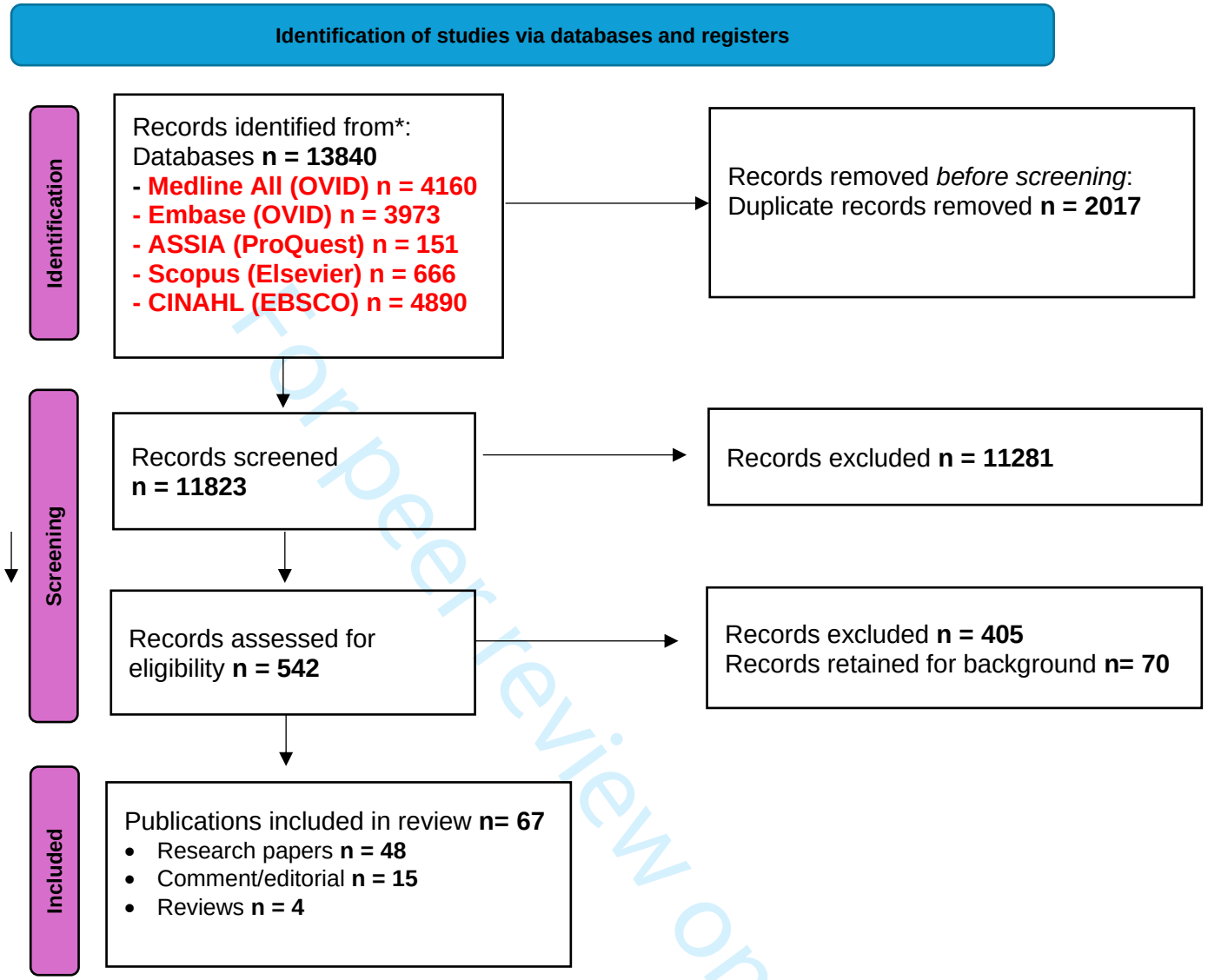
Figure 1: Key terms and their operational definitions in this scoping review

Figure 2: Prisma Flow Diagram

Figure 1: Key terms and their operational definitions in this scoping review

Key term	Operational Definition
Health Professional (HP)	Any registered healthcare professional including Doctors, Surgeons, Nurses, Midwives, or Allied Healthcare Professionals.
Clinical Decision-making	A judgement or decision that influences any aspects of care organised or delivered by the HP such as choices made about the diagnostic tests, and referrals seeking specialist input. It also includes decisions about specific treatments such as surgical procedures, therapies, or medications, as well as ceasing or withdrawing active treatment.
Socio Economic Status (SES)	Any single discrete measure of SES as set out in the Multiple Indices of Deprivation or the Multidimensions of Deprivation, including factors such as income, education, physical environment or neighbourhood quality, and health[14,15]. Any discrete measures that can be used as a proxy for the SES of a patient in HP decision-making such as income, unemployment, education.

Figure 2: Prisma Flow Diagram



Supplementary Material – Search Strategies

Medline ALL (OVIDSP): 1946 to present

1. Socioeconomic Factors/
2. employment/
3. unemployment/
4. Economic Status/
5. Educational Status/
6. Medical Indigency/
7. exp Social Class/
8. exp Health Status Disparities/
9. exp Healthcare Disparities/
10. exp Poverty/
11. exp poverty areas/
12. ((social or socio economic or socioeconomic or economic or income) adj4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*)).tw.
13. ((education* or employment) adj2 (status or level)).tw.
14. (sociodemographic or socio demographic or income or wealth or poverty or affluen*).tw.
15. SES.tw.
16. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 12 or 13 or 14 or 15
17. exp Clinical Decision-Making/
18. exp Decision Making/
19. Patient Care Management/
20. exp disease management/
21. ((Clinical or medical or health or treatment*) adj2 (decision* or decid* or option* or choice*)).tw.
22. (treatment* adj2 (select* or recommend* or receipt)).tw.
23. 17 or 18 or 19 or 20 or 21 or 22

24. exp Prejudice/

25. exp "Attitude of Health Personnel"/

26. exp Professional-Patient Relations/

27. exp Unconscious, Psychology/

28. "unconscious bias*".tw.

29. ((Implicit or explicit) adj3 (cognition or bias*)).tw.

30. prejudice.tw.

31. stereotyp*.tw.

32. Classism.tw.

33. (treatment* adj2 (unequal or differential)).tw.

34. (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or "General Practitioner*" or GP*) adj3 (attitude or judg* or bias)).tw.

35. exp Health Personnel/

36. exp Students, health occupations/

37. 35 or 36

38. exp Psychology, social/

39. exp Mental Processes/

40. 38 or 39

41. 37 and 40

42. 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 41

43. 16 and 23 and 42

EMBASE (OVIDSP): 1947 to present

1. socioeconomics/

2. economic status/

3. income group/

4. poverty/

5. exp employment status/

6. exp educational status/

7. exp social status/

8. exp health care disparity/

9. exp health disparity/

10. ((social or socio economic or socioeconomic or economic or income) adj4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*)).tw.

11. ((education* or employment) adj2 (status or level)).tw.

12. (sociodemographic or socio demographic or income or wealth or poverty or affluen*).tw.

13. SES.tw.

14. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13

15. exp clinical decision making/

16. exp medical decision making/

17. exp decision making/

18. patient care/

19. disease management/

20. ((Clinical or medical or health or treatment*) adj2 (decision* or decid* or option* or choice*)).tw.

21. (treatment* adj2 (select* or recommend* or receipt)).tw.

22. 15 or 16 or 17 or 18 or 19 or 20 or 21

23. exp prejudice/

24. exp cognitive bias/

25. exp health personnel attitude/

26. exp professional-patient relationship/

27. exp ego development/

28. exp stereotypy/

29. prejudice.tw.

30. stereotyp*.tw.

31. Classism.tw.

32. (treatment* adj2 (unequal or differential)).tw.

33. (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or "general practitioner*" or GP*) adj2 (attitude or judg* or bias)).tw.

34. exp health care personnel/

35. exp health student/

36. 34 or 35

37. exp social psychology/

38. cognition/

39. mental function/

40. 37 or 38 or 39

41. 36 and 40

42. 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 41

43. 14 and 22 and 42

44 limit 43 to english language

ASSIA (Proquest): 1987 to present

((MAINSUBJECT.EXACT.EXPLODE("Socioeconomic factors") OR MAINSUBJECT.EXACT.EXPLODE("Socioeconomic indicators") OR MAINSUBJECT.EXACT.EXPLODE("Socioeconomic conditions") OR MAINSUBJECT.EXACT("Employment") OR MAINSUBJECT.EXACT("Unemployment") OR MAINSUBJECT.EXACT("Poverty") OR MAINSUBJECT.EXACT.EXPLODE("Low income people") OR ab((social NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((socio economic NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((socioeconomic NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR

determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((sociodemographic OR socio demographic OR income OR wealth OR poverty OR affluen*))) AND (MAINSUBJECT.EXACT.EXPLODE("Decision making") OR ab(((Clinical OR medical OR health OR treatment*) NEAR/2 (decision* OR decid* OR option* OR choice*))) OR ab((treatment* NEAR/2 (select* OR recommend* OR receipt))))) AND (MAINSUBJECT.EXACT("Bias") OR MAINSUBJECT.EXACT.EXPLODE("Cognitive bias") OR MAINSUBJECT.EXACT.EXPLODE("Prejudice") OR MAINSUBJECT.EXACT.EXPLODE("Health professional-Patient relationships") OR ab(((Implicit OR explicit) NEAR/3 (cognition OR bias*))) OR ab("unconscious bias*") OR ab(Classism) OR ab((treatment* NEAR/2 (unequal OR differential))) OR ab(Stereotyp*) OR ab((("Health professional*" OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR SHO* OR surgeon* OR student* OR AHP* OR allied OR physio* OR speech OR occupational OR Dietitian* OR therapist* OR radiographer* OR midwi* OR "general practitioner*" OR GP*) NEAR/2 (attitude OR judg* OR bias*)))) OR ab(prejudice*))

Scopus (Elsevier): 1960 to present

((TITLE-ABS-KEY (social W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR (TITLE-ABS-KEY ("socio economic" W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR (TITLE-ABS-KEY (socioeconomic W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ((TITLE-ABS-KEY (sociodemographic)) AND (TITLE-ABS-KEY (income OR wealth OR poverty OR affluen*))) OR (TITLE-ABS-KEY (employment OR unemployment))) AND ((TITLE-ABS-KEY (clinical W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (medical W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (health W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (treatment W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY ((treatment OR clinical) W/2 recommend*))) AND ((TITLE-ABS-KEY ("health professional" -patient W/1 relations)) OR (TITLE-ABS-KEY (doctor-patient W/1 relations)) OR (TITLE-ABS-KEY (clinician-patient W/1 relations)) OR (TITLE-ABS-KEY (nurse-patient W/1 relations)) OR (TITLE-ABS-KEY ("unconscious bias*")) OR (TITLE-ABS-KEY ((implicit OR explicit) W/3 bias*)) OR (TITLE-ABS-KEY ((implicit OR explicit) W/3 cognition)) OR (TITLE-ABS-KEY (classism)) OR (TITLE-ABS-KEY (prejudice*)) OR (TITLE-ABS-KEY (("Health professional" * OR nurse* OR doctor* OR clinician* OR physician* OR

registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi*) W/2 attitude*)) OR (TITLE-ABS-KEY (("Health professional" * OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi*) W/2 bias*)) OR (TITLE-ABS-KEY (treatment* W/2 (unequal OR differential))) OR (TITLE-ABS-KEY (("Health professional*" * OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi* OR “general practitioner*” OR GP*) W/2 judg*)))

CINAHL (EBSCO): 1976 to present

S52 S16 AND S24 AND S50 Narrow by Language: - english

S51 S16 AND S24 AND S50

S50 S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S49

S49 S45 AND S48

S48 S46 OR S47

S47 (MH "Mental Processes+")

S46 (MH "Psychology, Social+")

S45 S43 OR S44

S44 (MH "Students, Health Occupations+")

S43 (MH "Health Personnel+")

S42 AB (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi*) N2 (attitude or judg* or bias*))

S41 TI (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or “general practitioner*” or GP*) N2 (attitude or judg* or bias*))

S40 AB (treatment* N2 (unequal or differential))

S39 TI (treatment* N2 (unequal or differential))

S38 AB Classism

S37 TI Classism

S36 AB stereotyp*

S35 TI stereotyp*

S34 AB prejudice

S33 TI prejudice

S32 AB ((Implicit or explicit) N3 (cognition or bias*))

S31 TI ((Implicit or explicit) N3 (cognition or bias*))

S30 AB "unconscious bias*"

S29 TI "unconscious bias*"

S28 (MH "Unconscious (Psychology)")

S27 (MH "Professional-Patient Relations+")

S26 (MH "Attitude of Health Personnel+")

S25 (MH "Prejudice+")

S24 S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23

S23 AB (treatment* N2 (select* or recommend* or receipt))

S22 TI (treatment* N2 (select* or recommend* or receipt))

S21 AB ((Clinical or medical or health or treatment*) N2 (decision* or decid* or option* or choice*))

S20 TI ((Clinical or medical or health or treatment*) N2 (decision* or decid* or option* or choice*))

S19 (MH "Disease Management")

S18 (MH "Decision Making+")

S17 (MH "Decision Making, Clinical+")

S16 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15

S15 AB SES

S14 TI SES

S13 AB (sociodemographic or socio demographic or income or wealth or poverty or affluen*)

S12 TI (sociodemographic or socio demographic or income or wealth or poverty or affluen*)

S11 AB ((social or socio economic or socioeconomic or economic or income) N4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*))

S10 TI ((social or socio economic or socioeconomic or economic or income) N4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*))

S9 (MH "Economic Status")

S8 (MH "Poverty Areas")

S7 (MH "Poverty+")

S6 (MH "Healthcare Disparities")

S5 (MH "Health Status Disparities")

S4 (MH "Social Class+")

S3 (MH "Unemployment")

S2 (MH "Employment+")

S1 (MH "Socioeconomic Factors+")

Supplementary Material 2. Scoping Review Data Extraction Tool

Adapted from the JBI Scoping Review Data Extraction tool[20]

Scoping Review Details	
Scoping Review title:	Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review
Review objective/s:	To scope the reported impact of HP bias about SES on clinical decision making and its effect on the care for people with lower SES in wider literature
Review question/s:	• RQ1: What has been published about implicit SES bias and HP attitudes or behaviours when deciding/providing care. • RQ2: How does SES effect the dynamics of the HP and patient relationship? • RQ3: What recommendations for practice have been postulated, implemented, or evaluated to address HP implicit bias related to SES.
Inclusion/Exclusion Criteria	
Population: Adults	
Concept: SES	
Context: HP decision making	
Types of publication or evidence source	
Evidence source Details and Characteristics	
Citation details (e.g., author/s, date, title, journal, volume, issue, pages)	
Country	
Context – professional group	
Disease group (if applicable)	
Participants (details e.g., age/sex and number)	
SES Terminology used.	
Details/Results extracted from source of evidence	
SES effect on HP and patient relationship	

Implicit biases, attitudes or behaviours that connect SES and decision making	
Healthcare professionals' decision making, and the impact of the decisions made **Types of Healthcare professionals, care context and/or setting**	
Recommendations for practice to mitigate bias	
Identify how SES was measured in the included papers.	

Table 3 Paper Characteristics

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
1	Crane (1975) USA	**Research Paper** Vignette case studies and Questionnaire	To assess the appropriateness of social as compared to physiological criteria in deciding to treat critically ill patient.	**Doctors** Internal Medicine and Neurosurgery	Case studies based on occupation and employment. A Banker and an unemployed Labourer.	**Yes**	Doctors did differentiate between a patient with a high and low status occupation when making decisions about the aggressiveness of treatment offered. However, when asked to rank the relative influence of social characteristics upon their decisions to treat chronically ill patients, they ranked social criteria as having a low influence on their decision-making.
2	Eisenberg (1979) USA	**Editorial/Comment** NA	Sociologic Influences on Decision-Making by Clinicians	**Doctors** Specialism not specified.	This paper reviews the contributions to our understanding of sociologic influences on clinical decision-making.	**NA**	The bulk of the available literature implies a significant relation between social class and decisions regarding patient management. Further investigation is needed- various methods of sociologic research could be used to provide the data for these studies e.g., participant observation, record review, questionnaires, interviews, case studies, or direct recording of the interaction.
3	MacCormick et al (1990) Canada	**Research Paper** Vignette – Four clinical scenarios	To assess decision-making in cancer treatments using age and SES as independent variables.	Medical Students	Occupation and employment were used as a proxy for SES. In this study SES was assessed with age. and it is difficult to separate these in the results.	**Yes**	Personal bias of the physician plays a role in decision-making about treatment for cancer in these vignettes. It is difficult to separate age and SES these in the results. Statistically significant differences $p<0.001$ in decisions to treat younger professional than older persons. Statistically significant differences $p<0.001$ in decisions to treat a young mother than a young female "mentally handicapped" person.
4	Brown (1993) USA	**Research Paper** Interviews and focus groups. seventy-two health, social work, administrative research, and advocacy HPs	Exploration of class and confidentiality for mothers with HIV.	Multi-professional Obstetrics:	Income	**Yes**	Lower social class people not viewed as holding their confidentiality as a personal priority - it matters less to them. Mums with greater authority due to income, political or social standings can expect greater confidentiality compared to mothers who are less economically fortunate.
5	McKinlay et al (1996) USA	**Research Paper** Vignette video scenarios 1. Chest pain 2. Dyspnoea	To assess non-medical influences on decision-making.	**Doctors** coronary heart disease.	socioeconomic status, and health insurance coverage.	**Yes**	A link found between insurance coverage on cardiac diagnosis for chest pain, particularly in the older patients. Intersectionality with Age. Among the older patients, those with insurance were significantly more likely to receive the primary cardiac diagnosis than those without insurance, whereas among younger patients' insurance had no effect.
6	McKinlay et al. (1997) USA	**Research Paper** Vignette cancer video scenarios involving a breast mass	To assess non-medical influences on decision-making	**Doctors** Breast Cancer	Patient characteristics were varied in the videotapes to indicate socioeconomic	**Yes**	Women of lower SES were more likely to receive less aggressive care ($p<0.07$). physicians recommended either chemotherapy or tamoxifen to 73% of higher SES women, compared with 53% of lower SES women.

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					status: dress, grammatical style, and insurance status		Insurance and ability to pay also were associated with disparity in physician recommendations.
7	Feldman et al 1997 Ml... USA	**Research Paper** An Experimental Technique Using Videotapes, Factorial Design, and Survey Sampling.	To assess non-medical influences on decision-making.	**Doctors** Secondary care	Challenging to ascertain how SES was measured or described	**No**	The data suggest that the physician subjects gave clinically valid answers to the questions and that the variations in clinical decision-making identified by the factorial experiment can be interpreted as generalizable differences.
8	Wolder-Leven et al 1998 USA	**Editorial/Comment** Social Class and Medical Decision-making	People of different classes may receive differential treatment from providers for the same health conditions due to discrimination based on class.	**Doctors** Specialism not specified.	Paper discusses SES measures - as indicators of class. The word class works as a shorthand to refer to a person's social location, a "lived reality," in which life chances, values, health and well-being, morbidity and mortality, and concepts of self, other, and collectively are shaped by the relationship of the individual to the social organization of production. Should stop trying to define class in terms of a set of socioeconomic indicators such as income level.	**NA**	it is important to recognize that giving people the same choices about medical treatments does not necessarily mean that they are being treated equally, because patients do not lead equal lives. At the point of medical decision-making it becomes clear that class-based differences can even lead to difference between life and death.
9	Parens 1998 USA	**Editorial/Comment** Social Class and Medical Decision-making.	Bioethicists often discuss issues of social class in relation to access to health services - bioethics literature reveals that class is rarely a focus in the analysis of medical decision-making.	**Doctors** Specialism not specified.	Considering a person's SES might lead to not offering treatment to a person who does not have the resources and only offering it to people with those resources. An understanding of class and its relationship to medical decision-making should be used to provide equity and not to explain away unwarranted variations in care.	**NA**	Health care providers need to listen to patients in unaccustomed ways, the next and much bigger step will be to think systematically about how to promote such listening particularly with time constraints on health professionals.

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10	Krupat et al 1999 USA	**Research Paper** Vignette – Video	To determine whether assertive patient behaviour influences physician decision-making in the treatment of older breast cancer patients.	**Doctors** Cancer	Socioeconomic status [as well as age, race, mobility, general health, and assertive behaviour] of the patients were varied.	**Yes**	Assertive behaviour on behalf of a women with lower SES helps them to get testing e.g., auxiliary node biopsy. Assertiveness led to more careful diagnostic testing for patients who came from groups that are "disadvantaged."
11	Gordon et al 2000 USA	**Research Paper** Cross-sectional study design, interviews using semi-structured questionnaire of physicians and patents.	An assessment of Patient-Nephrologist discussions about kidney transplantation as a treatment option	**Doctors** Haemodialysis and Nephrologists	SES determined by education level, occupational level, and socioeconomic status level. All low to high rated.	**Yes**	Bias is not overtly discussed however finding show fewer medical explanations and less time spent with patients of Low SES. Patient age and socioeconomic status influence discussions of transplantation as a treatment option. low socioeconomic status patients were less likely to report being encouraged even after adjustment for transplant suitability.
12	Van-Ryn et al 2000 USA	**Research Paper** Survey data examined	The degree to which patient race and socio-economic status effects physicians' perceptions of patients	**Doctors** post-angiogram care.	A three-category measure of SES was developed. The SES index was created by standardizing patient income and education and averaging the two together.	**Yes**	Intersectionality with race is difficult to unpick. Low SES patients viewed as less likely to be pleasant and rationale. physicians gave lower SES patients more negative ratings on personality characteristics (lack of self-control, irrationality) and level of intelligence.
13	McKinlay et al 2002 USA	**Research Paper** Vignette video study 1. Polymyalgia 2. Depression	To assess the influence of non-medical factors on decision-making.	**Doctors** Internalist and primary care	SES depicted by appearance and employment in the video vignettes	**No**	SES of the patient does not show any impact on decision-making.
14	Tamayo-Sarver (2003) USA	**Research Paper** Vignette 1. Ankle Fracture 2. Migraine Non-traumatic back pain.	To measure the Effect of Race/Ethnicity and Desirable Social Characteristics on Physicians Decisions to Prescribe Opioid Analgesics	**Doctors** Emergency Department	Occupation and/or relationship with a primary care provider.	**Yes**	Race did not impact on prescribing differences. SES and information about patient social desirability (e.g., occupation) increased the rates of prescribing for the migraine and back pain patient vignette, but this did not alter the rate for ankle fracture. There were statistically discernible increases in the rate of prescribing, 4% ($p<0.04$) for migraine and 6% ($p<0.01$) for back pain. The information on socially desirable characteristics may have affected physicians' perceived likelihood that the patient is feigning illness and surreptitiously seeking opioids.

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15	Henley et al 2004 USA	**Editorial/Comment** 10 steps for avoiding health disparities in your practice	Discussion about disparities and health inequalities.	**Doctors** Specialism not specified.	Discusses intersectionality. The evidence regarding differences in the care of patients based on race, ethnicity, gender, and socioeconomic status suggests that if this patient is a woman or African American or from a lower socioeconomic class, resultant morbidity or mortality will be higher.	**NA**	Recommends that minimising the effect of bias and stereotyping could be achieved for all patients by using evidence-based practice guidelines.
16	Manderbacka 2005 Finland	**Research Paper** Exploratory qualitative study	Trace key points in the treatment where patients gender & SES experience differences	**Doctors** Coronary heart disease.	Blue-collar and white-collar occupations	**Yes**	There was a doctor-centred model common among blue-collar workers and an increased patient centred model with shared decision-making common among those using private care 'white collar occupations. The utilization of private care is clearly concentrated in higher socioeconomic groups in Finland.
17	Arber et al 2006 UK	**Research Paper** A video-simulation experiment. Conducted simultaneously in both USA and UK	Patient characteristics and inequalities in doctors' diagnostic and management strategies relating to CHD.	**Doctors** Coronary heart disease	SES indicated by occupation and dress - middle class (schoolteacher) or working class (cleaner in UK; janitor in US). Class was also expressed by style of dress and appearance.	**No**	Class was not significantly associated with any aspect of doctors' information gathering or decision-making.
18	Barnhart et al 2006 USA	**Research Paper** Questionnaires developed from focus groups.	Can Non-medical Factors Contribute to Disparities in Coronary Heart disease treatments.	**Doctors** coronary heart disease	socioeconomic status discussed in terms of finance barriers - social support (ability/insurance to pay for a revascularization procedure) as judged by the physician.	**Yes**	People with low SES were not trusted by the physician. Patients most knowledgeable (and assertive) about the procedure, and those with resources, who were most likely to adopt a healthy lifestyle (as perceived by the physician) are most likely to receive recommendations for revascularisation.
19	Denburg et al 2006 USA	**Research Paper** Randomised, 2X2 factorial design clinical vignette.	The Influence of Patient Race and Social Vulnerability on Urologist Treatment Recommendations in Localized Prostate Carcinoma.	**Doctors** Cancer	Middle income (and married) Low Income (and widowed) therefore the variables were not distinct.	**Yes**	Watchful waiting offered more frequently for socially vulnerable patients (low income and widowed) - both white and black patients. Intersectionality means that low income/widowed black patients received the lowest referral for radical prostatectomy. Low income/widowed white men also received lower referral for prostatectomy.

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20	Bernheim et al 2008 USA	**Research Paper** A Qualitative Study semi structured interviews	Influence of Patients' Socioeconomic Status on Clinical Management Decisions.	**Doctors** Primary care	As described by the participants: Economic Uninsured - Unemployed- On welfare- Sociocultural- Low educational achievement- Poor social networks.	**Yes**	All physicians recounted circumstances in which the patient's SES did affect their clinical management decisions. Even physicians who initially asserted that all patients in their practice received identical care later described differences based on patient SES.
21	Eggly et al 2008 USA	**Research Paper** Video recorded outpatient interactions during which oncologists invited patients to participate in clinical trials.	Oncologists' recommendations of clinical trial participation to patients	**Doctors** cancer	SES determined by education: high school or less technical or trade school college or greater.	**No**	Data showed that people with higher education (0.07) received more recommendations than men and those with lower education. This was not statistically significant.
22	Ling Fan et al 2008 USA	**Review** A search of the Internet identified thousands of Web sites, documents, reports, and educational materials pertaining to health and pain disparities.	Awareness and Action for Eliminating Health Care Disparities in Pain Care: Web-Based	**Multi-professional** Palliative care.	Paper discusses SES	**NA**	Studies have explored the factors influencing the often-unintentional pervasive nature of biases and stereotyping that affect treatment decisions for managing pain. Discriminatory practices that are deep seated in biases, stereotypes, and uncertainties around communication and decision-making processes contributing to inequities in care.
23	Franks et al 2008 USA	**Editorial/Comment** This paper examines a hierarchy of three domains for interventions to address health inequalities downstream. 1. health system 2. provider–patient interactions 3. clinical decision-making	Upstream or fundamental causes (such as poverty, limited education, and compromised healthcare access) is essential to reduce healthcare disparities. But such approaches are not sufficient, and downstream interventions, addressing the consequences of those fundamental causes.	**Doctors** Specialism not specified.	Paper discusses SES	**NA**	Physician biases likely to contribute to disparities. Greater social and cultural distance between providers and patients increases the potential for suboptimal encounters. Patients at greater social risk for adverse health outcomes have encounters characterized by less patient participation and providers viewing those encounters more negatively.

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24	Nampiaparampil et al 2009 USA	**Research Paper** Vignette - double-blinded randomized controlled study.1. patient with chronic low back. 2. lower extremity pain	To assess the contribution of non-medical decision-making to the assessment and management of pain.	**Doctors** rehabilitation community hospitals	Medical insurance Blue Cross Vs Medicaid	**Yes**	Unable to unpick race and insurance status in these vignette examples. Patient ethnicity/SES differences in the prescription of morphine (p = 0.053). Patient ethnicity/SES significantly affected the rate of referral for a nerve block (P = 0.04).
25	Wilson 2009 UK	**Research Paper** Vignette – case scenarios. One of two patient scenarios was employed in a self-administered questionnaire	Scenarios and Questionnaires addressed pain knowledge, inferences of physical pain, general attitudes, and beliefs about pain management. The participants were required to identify the patient's pain level and make pain management decisions.	**Nurses** pain	The variable lifestyle/socio-economic status (SES) of the patient was manipulated; all other patient variables were kept constant. High SES - businessperson Low SES - unemployed construction worker	**Yes**	There was a difference in pain management between high and low SES patients - both general and CNS nurses showed inferences of patient pain and management decisions which are based on myths about Low SES addiction. There was an observed trend to be more likely to under medicate low SES over high SES patients.
26	Ceballo et al 2010 USA	**Research Paper** A three-page survey was mailed to physicians in one state. Case scenario of a young women trying to get pregnant. The patient's race and social class varied across the surveys.	Surveyed about their knowledge of infertility among different demographic groups of women and examines how patient and physician characteristics may influence physicians' treatment responses to hypothetical infertile patients.	**Doctors** Family planning	Different educational groups were used to reflect social class differences among women.	**No**	Referral practices did vary related to insurance status of the patient. Physicians' reluctance to refer Medicaid patients to infertility specialists is explained as understandable given the great expense of specialized infertility services and the lack of Medicaid insurance coverage for such services.

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27	Gilbert et al 2010 Canada	**Research Paper** A retrospective cohort study of women with a previous Caesarean section.	Does Education Level Influence the Decision to Undergo Elective Repeat Caesarean Section Among Women with a Previous Caesarean Section.	**Doctors** Obstetrics	Education level was stratified.	**Yes**	Higher education is associated with an increased rate of elective repeat Caesarean section ($p<0.047$ and $p<0.03$). Whether this is due to patient differences or physician bias, physicians should be aware of this disparity and should attempt to provide unbiased informed consent for all women
28	Hajjaj et al 2010 UK	**Research Paper** Semi-structured qualitative interviews were conducted with clinicians working in departments of dermatology	Assessment of nonclinical influences, beyond diagnosis and severity, on clinical decision-making in dermatology.	**Doctors** Dermatology	Education level and financial status and treatment related costs	**Yes**	This paper does not offer a strong link between SES and decision-making. Sixty five percent of clinicians said that treatment-related costs that patients are likely to incur would sometimes influence their decision-making inability to afford transportation costs or cost of child minding at home. 19.6% clinicians raised education/intelligence as an issue especially relating to cases where systemic treatments with potential side-effects are required. Where there is a lack of awareness or understanding of the range of influences, there is a risk that some influences may *subconsciously* adversely impact on optimal decision.
29	Kristine Bærøe and Berit Bringeda 2011 Norway	**Editorial/Comment** A discussion about the conditions for acceptable and unacceptable priority settings with respect to patients' socioeconomic status.	The pattern is equal in all countries, the higher the socioeconomic status (SES) of patients, the better the health and the higher the life expectancy; health prospects are distributed along a social gradient.	**Doctors** Specialism not specified.	Paper discussed SES	**NA**	Health inequity in healthcare services by inaccurate interpretations of 'healthcare need' and biased care due to unconscious influence by patients' SES. Prioritisation of health need according to SES as a basis of equity is not ethical. Socioeconomic Factors and their impact on health should be forefront of HP thinking - raising awareness in order to prevent reinforcement of health inequity.
30	Detsky 2010 USA	**Editorial/Comment** HP provide services and make decisions about diagnostics, treatments, procedures etc. There are variations.	The paper discusses... ... GPs and surgeons are biased against women, people from low SES groups, and other minority groups?	**Doctors** Specialism not specified.	Paper discussed SES	**NA**	Unintentional bias, which is far more common than intentional corruption, is particularly worrisome because humans are facile with rationalizing and often are not even aware of their bias. It is difficult to overcome bias that one does not even know is there.

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31	Paul Dieppe 2011 UK	**Editorial/Comment** A discussion about the inequalities in the provision of surgical Interventions for people with Rheumatology conditions.	In the context of state provided healthcare - many studies have shown that older people, women, ethnic minorities, and those of lower SES are all likely to receive variations in inventions compared to well-off, middle aged white males.	**Doctors** Rheumatology	Paper discussed SES	**NA**	The paper finds significant effects of SES on both hip and knee joint replacement rates for people with Osteoarthritis. It suggests that GPs and surgeons are biased against women, low SES patients, and other minority groups.
32	Dougal et al 2010 USA	**Research Paper** Online national survey	the influence of SES was examined on psychotherapists cognitive attributions and counter-transferences.	**Psychological therapists** Mental Health	Paper discusses SES	**Yes**	SES impacts on counter-transference reactions and clinical judgments according to SES. Rated interpersonal behaviour of the client with higher SES has evoking feelings of dominance more so than the lower SES. CAS measurement of 'causal attribution' found no statistically significant differences related to clinical judgment
33	Haider et al 2010 USA	**Research Paper** Clinical vignettes. The survey included the Implicit Association Test (IAT) to assess unconscious preferences	To estimate unconscious race and social class bias among first-year medical students and investigate its relationship with assessment.	**Medical students**	Social class was depicted using occupation. Patient vocation is commonly used as a proxy for social class. Patient occupations were chosen using the NamPowers occupational prestige scale, which ranks occupations on a scale from 1 to 100.	**No**	IAT testing showed A preference toward those in the upper class among 174 students (86%). a lower-class preference in 6 (3%). Multivariable analyses for all vignettes found no significant relationship between implicit biases and clinical assessment. Analysis stratified by patient race or class did not demonstrate any statistically significant association between student IAT scores and how students assessed patients for any of the vignettes. No interaction between IAT D scores and vignette patient class (or race) was found for any of the vignettes.
34	McKinlay et al 2012 USA	**Research Paper** A factorial experiment using video vignettes was conducted. 1. Patient symptoms of diabetes 2. Known diabetes with emerging peripheral neuropathy.	To investigate additional causes of health care disparities in the decision-making of primary care doctors.	**Doctors** Primary care	Appearance altered to reflect Class. Men presented with collar and tie (upper SES) or plaid shirt and jacket (lower SES). Women presented with either blazer with broach and makeup (high SES) or sweatshirt and no makeup (lower SES).	**Yes**	clinical management (specifically for foot neuropathy) is influenced by patient socioeconomic status (SES). Overall, upper SES patients would receive these essential examinations compared with lower SES patients. Upper SES patients were slightly more likely to be asked questions about their medical history ($P < 0.05$ for history of eye disease) and were more frequently referred to ophthalmologist ($P = 0.024$).

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35	Shawahna et al 2012 Pakistan	**Research Paper** Qualitative with two observational phases. Semi-structured interviews - 2 hospitals, 2 diabetes care centres and 2 private clinics. Prescriptions were analysed for socioeconomic indicators. In the second phase, the opinions of a panel of prescribers on the influence socioeconomic indicators on prescribing behaviour were elicited.	To investigate physician's perspectives of patients' SES and the important indicators influencing prescribing behaviour.	**Doctors** Diabetes	participants described SES based on 'job role' and a judgment about whether the person might be able to afford treatment.	**Yes**	Literacy, educational background, compliance, dress, and appearance were important indicators at the time of clinical decision-making for physicians originating from urban areas. Participating physicians agreed that patient's socioeconomic status influenced their drug prescribing behaviour
36	Smith-oka 2012 Mexico	**Research Paper** Interviews and participant observation	To investigate Risk – motherhood in a Mexican public hospital.	**Multi-professional Doctors, Midwives, and Nurses**. Obstetrics	Income and area od residence	**Yes**	Good mothers are married, knowledgeable, follows norms. Bad mothers are unmarried, uneducated, deviant. These views thought to reflect the paternalistic class structure of Mexican society. Explicit bias of low SES single mothers evident in this research - linked again to cooperation. Pressure for sterilisation Vs the use of an IUD in low SES women.

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37	Lay-Yee er al 2013 NZ	**Research Paper** Sample of 9272 encounters at 185 family practices. Each practitioner was asked to provide data on themselves and on their practice, and to report on every fourth of their patients (a 25% sample) in each of two week-long periods separated by an interval of six months. The questionnaire recorded data about the patient, his or her problems and their management.	social disparities in health are pervasive features of health care systems. studying inter-practitioner variation in clinical activity across four payment types in New Zealand primary care system.	**Doctors** Primary Care	deprivation level - NZ multi-index of deprivation used quintiles 1-5	**Yes**	There was greater variability of practitioner decision-making for socially disadvantaged patients found in fee-for service settings. Practitioners may have difficulty processing relevant clinical information for socially disadvantaged patients, and this greater degree of uncertainty may in turn be reflected in more variable decision-making. While there was little evidence in this primary care sample of systematic bias in clinical activity level by patient social group, practitioner variability was much more marked for patients drawn from ethnically and socio-economically disadvantaged background.
38	Haider et al 2014 USA	**Research Paper** Participants completed nine clinical vignettes, each with three trauma/acute care surgery management questions. social class IAT assessments were completed by each participant. Multivariable, ordered logistic regression to test IAT on decision-making.	To assess Unconscious race and class bias and Its association with decision-making by trauma and acute care surgeons	**Doctors** Trauma	Social class stated in Vignette.	**No**	90.7% demonstrated an implicit preference toward upper social class persons. Biases were not statistically significantly associated with clinical decision-making So despite high levels of implicit bias this did not alter the decisions made by the physician in a statistically significant way.

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39	Haider et al 2015 USA	**Research Paper** Prospective Vignette study conducted among surgical RNs. Implicit association tests (IATs) for social class and race. Ordered logistic regression	To assess unconscious Race and Class Biases among Registered Nurses.	**Nurses** Surgery	patients' race or social class were randomly altered. Social class vignettes used patients' occupations as proxies for their social status.	**No**	93.47% demonstrated an implicit preference toward upper social class persons. Participants were more likely to think that a lower SES with anxiety did not understand the procedure and needed to be re-consented. Intersectionality detected between race and SES and the use of post-surgical restraints and sedation. Implicit biases among RNs did not correlate with clinical decision-making. Presence of an unconscious bias was not associated with any overall differences in vignette-based clinical assessment and decision-making.
40	Haider et al 2015 USA	**Research Paper** Clinical vignettes, each with 3 management questions. Ordered logistic regression analysis on the Implicit Association Test (IAT) scores and used multivariable analysis to determine whether implicit bias was associated with the vignette responses.	To assess the relationship between unconscious bias and clinical decision-making	**Doctors** Surgery	The paper does not state how SES was communicated via the vignette style study.	**No**	Although implicit biases of race and social class were present among most of the trauma and acute care clinician respondents, these biases were not associated with clinical decision-making. Clinicians were less likely to order an MRI of the cervical spine for patients with neck tenderness after a motor vehicle crash for low SES patients - this is hypothesised to be linked to health insurance status.
41	John-Henderson 2015 USA	**Editorial/Comment** Implicit bias od SES discussed along with as implicit bias of race, gender, suicidal ideation, and obesity).	Implicit cognition implications for global health	**Doctors** Mental health	paper discusses the use of the MacArthur SES scale - which is a self-rated 'place a cross on the ladder to indicate your position' scale	**NA**	Biases and discussed alongside resilience. The paper recommends an investigation into why some HPs make biased decisions and some do not. This could reduce the overall impact of implicit biases on health, both at the level of the individual and by positively affecting the relationship between patient and physician.
42	Williams et al 2015 USA	**Research Paper** Vignette based study - surveyed seniors at 84 medical schools. two clinically equivalent management options for a set of cardiac patient vignettes. examined variations in student recommendations.	Investigation of variations in medical student recommendations based on patient race, gender, and socioeconomic status.	**Doctors** coronary heart disease	Patient SES was determined solely by the Hollingshead Occupational Scale and was fixed for each individual vignette but varied across the set of eight cardiac vignettes.	**Yes**	Patient SES was a strong and significant predictor of student recommendations. With some intersectionality - when the patient was presented as being in the lowest SES group (SES 1–2), students were more likely to recommend procedures for black patients, and least likely to do so for white female patients. Judgmental attitudes from providers, even if not explicitly expressed, negatively affect physician–patient trust.

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43	Castaneda-Guarderas et al 2016 USA	**Editorial/Comment** A discussion about shared decision-making with vulnerable Populations in the Emergency Department.	This paper considers the future research agenda needed to examine shared decision-making with vulnerable populations of people who present to emergency departments in the U.S.	**Doctors** Specialism not specified.	Discussed in terms of Socioeconomic Disadvantage uneducated unemployed uninsured	**NA**	Shared decision-making in the ED setting among patients with socioeconomic challenges may be inhibited by a perceived power differential between physicians and their patients, beyond that experienced by more affluent patients.
44	Elholm Madsen et al 2016 Denmark	**Research Paper** An experimental factorial vignette survey was used. Four different vignettes describing fictitious patient cases with different SES variables were randomly allocated to therapists working in somatic hospitals.	To investigate whether occupational therapists and physiotherapists are influenced by the patient's SES	**Occupational Therapist** Somatic care	Employment status and educational level were used as a proxy for SES. a white collar-worker (lawyer employed and unemployed) a blue collar-worker (janitor employed or unemployed);	**No**	There were no statistically significant associations between the patient's SES and the judgements related to the patient's rehabilitation OR the rehabilitation effort given in phase one or towards providing equal treatment in a therapeutic situation.
45	Popescu et al 2016 USA	**Research Paper** Retrospective 1995 - 2007 data collected from the SEER programme. Key interests were race and SES.	to understand whether between-physician and within physician variations play a role in cancer care disparities among seniors with breast and colorectal cancer enrolled in a national cancer surveillance program.	**Doctors** Cancer	Measured SES using patients' zip code median household income, categorized into deciles. SEER files contain several zip code and census tract-level SES variables.	**Yes**	Patients residing in high-income zip codes were more likely to receive treatment than patients residing in low-income zip codes (e.g., 69%, 53%, and 65% top decile income patients received BCS, chemotherapy, and radiation vs. 46%, 48%, and 43% bottom decile income patients).

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46	Fitzgerald et al 2017 International	**Systematic Review** PubMed, PsychINFO, PsychARTICLE and CINAHL were searched for peer-reviewed articles published between 1st March 2003 and 31st March 2013. Two reviewers assessed the eligibility of the identified papers based on precise content and quality criteria. The references of eligible papers were examined to identify further eligible studies.	To assess publications examining implicit bias in healthcare professionals.	**Multi-professional** NA	SES	**Yes**	All studies found evidence for SES implicit biases among physicians and nurses. Class may trump race in some circumstances so that being high SES is more salient than being non-white. Based on the available evidence, physicians, and nurses manifest implicit biases to a similar degree as the general population. Biases also exist for age, mental illness, weight, having AIDS, brain injured patients perceived to have contributed to their injury, intravenous drug users and disability.
47	Murphy et al 2017 USA	**Editorial/Comment** A discussion about socially at-risk populations in relation to health disparities.	Increasingly, it is recognized that disparities are driven not by differences in biology or individual patient characteristics, but rather by social determinants, or the conditions of the environments in which people live.	**Doctor** Specialism not specified.	Paper discusses socioeconomic position	**NA**	Bias manifests itself in behaviours that impede relationship building. Physicians with higher levels of general bias are more likely to talk slowly, have greater verbal dominance, and have less patient-centred dialogue. Implicit bias influences diagnosis, treatment recommendations, questions asked of the patient, and diagnostic tests ordered.

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48	Pettit et al 2017 USA	**Research Paper** High-fidelity simulation - randomly assigned to participate in a simulation of acute coronary syndrome. Students were blinded to study objectives. quantitative data were obtained on the number of times students performed the following patient actions: acknowledged patient by name, asked about pain, conversed, and touching the patient.	To test the effect of socioeconomic status bias on Medical Student–Patient interactions using an Emergency Medicine Simulation.	**Medical Students**	Mannequin - low SES depicted by a homeless person - dirt covered t-shirt and trousers. Mannequin - High SES depicted by executive dress - button down collar suit and tie etc.	**Yes**	Data demonstrate that Medical Students were more likely to ask the simulated patient with high SES about pain control (p = 0.04) and more likely to touch the low SES patient (p = 0.01). Paper discusses touch as a mechanism to communicate compassion - put could also be a display of power. Decision-making does not appear to be different - patient received aspirin and was sent for a cardiac catheterization in both groups.
49	Goddu et al 2018 USA	**Research Paper** Randomized vignette study of two chart notes employing stigmatizing versus neutral language to describe the same hypothetical patient, a 28-year-old man with sickle cell disease.	To assess if words matter… to assess if Stigmatizing Language aids in the transmission of Bias in the medical record	**Medical Students**	Vignette language portraying the patient negatively with irrelevant or unnecessary indicators of lower socioeconomic status such as hanging out with friends outside McDonald's.	**Yes**	Language may play a powerful role in influencing clinician attitudes and behaviour. Less aggressive pain management employed with the hypothetical patient who had low SES.
50	Brandao et al 2019 Portugal	**Research Paper** Two experimental Vignette studies	To investigate classism in pain care and the role of patient socioeconomic status on nurse's pain assessment and management practices	**Nurse** Pain	SES was manipulated by level of education and occupational activity	**Yes**	Overall, the higher-SES patient was perceived as having more intense pain than the lower-SES patients. The low-SES patient's pain was perceived as less credible than the high-SES patient's pain when distress cues were present. Patient SES influenced some of the nurses' pain assessments but not their management practices.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
51	Gonzales et al 2019 USA	**Research Paper** A telephone interviews incorporating Logistic regression models that assessed associations between race/ethnicity/education, medical discrimination, clinician mistrust, and treatment decision-making with concordance	To assess the associations between race/ethnicity/education, medical discrimination, clinician mistrust, and treatment decision-making and guideline concordance.	**Doctors** Cancer	Education level	**Yes**	Intersectionality. Socioeconomic factors influenced guidelines concordance. They found educational disparities in breast cancer treatment. Non-college-educated Black women had lower odds of guideline-concordant care vs. college-educated White women.
52	Hirsh et al 2019 USA	**Research Paper** Vignette style study. A randomized controlled trial.	To test a virtual perspective-taking intervention to reduce race and SES disparities in pain care	**Doctors** Pain	SES was represented visually by work attire: low SES patients - fast food uniform, and high SES – a business suit.	**Yes**	Statistically reliable treatment bias during the pain treatment decision-making pre-intervention. Forty seven percent of providers who were biased at baseline did not show a statistically reliable treatment bias one week later.
53	Vlietstra et al 2020 UK	**Research Paper** Vignette – participants randomised to one of two video vignettes. Representing a psychological assessment session with either a 'lower' or 'upper' class client.	To assess for SES variations in clinical reasoning, namely diagnosis, risk assessment and treatment, and to measure class self-awareness.	**Psychological therapeutic professionals** Working in the NHS	Class The accent and dress of the client were varied to elicit class stereotypes.	**No**	There was little difference in clinical reasoning between the two class conditions. The paper acknowledges that the dress variations did not portray class cues accurately or strongly enough to evoke a difference.
54	Anastas et al 2020 USA	**Research Paper** Vignette - 12 computer-simulated patients with chronic back pain that varied by race and SES (low/high). IAT also employed.	To assess provider attitudes on Chronic Pain Care Decisions.	**Doctors** pain	SES was indicated by occupation and depicted by clothing.	**Yes**	Strong implicit preference for high SES over low SES individuals. There were significant race × SES interaction effects on provider ratings of pain interference, distress, and workplace accommodations.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
55	Bynum 2020 USA	**Research Paper** Four doctors from two Community Health Centres convenient sample because they offer services to uninsured people	To assess the doctor's (Asthma Management) perceptions of uninsured patients.	**Doctors** primary care	Uninsured	**Yes**	3 out of the 4 Doctors indicated that low SES patients have issues with medication compliance. All the participants indicated that access to affordable medication due to patients' SES was a barrier. Paper states that it might be possible to improve physicians' decision-making through techniques that minimize biases.
56	Crandlemire 2020 Canada	**Editorial/Comment** A discussion about the literature regarding healthcare disparities for people with low SES and the role of unconscious biases held among healthcare providers.	Unconscious Bias in Nursing is more likely activated and more prevalent during high pressure or time sensitive scenarios, when people are busy and tired, or when decisions need to be made and there is missing or ambiguous information.	**Nurses** Specialism not specified.	SES	**NA**	Decision-making is influenced by both positive and negative attitudes toward people due to unconscious or conscious biases held by healthcare providers which can affect patient care outcomes.
57	Diniz et al 2020 International (different countries)	**Research Paper** A Mixed methods study. Video vignette: Two women, each doing two different pain-inducing movements. After watching the vignette nurses were asked to: 1. Associate five characteristics to the women. 2. write a brief story to describe 'the woman's pain and how it affects life recommending a treatment.	Examined how nurses' perceptions of pain patients' SES were associated with (more or less) dehumanizing inferences about their pain and different treatment recommendations.	**Nurses** Pain	The video vignette women SES was determined using the MacArthur Scale of Subjective Social Status (based on appearance). Low and middle SES women chosen for the videos.	**Yes**	Words associated with the middle SES women were - calm, friendly, informed, anxious, sociable. Words associated with the lower SES women were - withdrawn, tough, passive, hardworking, worried, poorly informed. Treatment decisions are similar except the low SES patient is referred to psychoeducation- because of a perceived lack of competence.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
58	Veesart et al 2020 US	**Editorial/Comment** A discussion about unconscious bias and how it might impact on nursing care.	Everyone has a cultural lens through which we view the world, which can sometimes create biases. Often, the decisions we make are directly influenced by those biases, even when we espouse other beliefs.	**Nurses** Specialism not specified.	SES	**NA**	Making decisions based on prejudices can have devastating impacts on nursing care. The first step in addressing this is self-awareness. Bias decisions often occur under stressful situations
59	Beyer et al 2021 UK	**Systematic review** Included works published between January 2004 and April 2020. PubMed, Embase and Cochrane Central databases	To assess the current evidence for factors that influence treatment decision-making in localized kidney Cancer	**Multi-Professional** cancer	socio economic status and education status - as reported in the primary papers.	**Yes**	Education status, socioeconomic status, a family history of cancer, and cancer anxiety can be barriers to treatment decisions in kidney cancer. SES and economic variables were identified as barriers to treatment decisions.
60	Chase 2021 USA	**Editorial/Comment** A discussion regarding health disparities research and the negative stereotypes and attitudes that providers can hold toward certain patient groups.	Biased interactions with providers are a dynamic two-way process that can influence patients' satisfaction and trust in the health care provider. Leading to impairments in the patient's health outcomes.	**Muti-professional** Cancer	SES	**NA**	Advantageous and standard-of-care treatments may not be recommended to certain patients because physicians believe that those patients may not adhere to them. When faced with limited time to adequately assess the patient's problem, physicians may rely on their implicit stereotypes to make hasty decisions.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
61	Khidir et al 2021 USA	**Research Paper** Cross-sectional analysis of a sample taken from 100% of Medicare claims for emergency department (ED) visits. ED visits from January 1, 2016, through December 31, 2019. Decision about admission or discharge were analysed according to race, Medicaid, and low income.	To estimate the consistency of ED physician admission propensities across categories of patient sex, race and ethnicity, and Medicaid enrolment.	**Doctors** Emergency care	insurance status - low income.	**No**	Doctors who are more or less likely to admit patients from the ED are more or less likely to do so regardless of SES. No evidence of SES bias and decision-making about admission established.
62	Manzer et al 2021 USA	**Research Paper** Qualitative Interviews	To assess bias through the case of contraception.	**Multi-professional** Family Planning.	SES and Class	**Yes**	Participants link pregnancy risk to women of low SES. Differences in contraception advice found. HPs more likely to steer patients of low SES toward long-acting contraception - can last 1 year or more, rather than prioritizing patients' preferences. HP Bias decision-making may be exacerbated by the fast-paced, high-stress environments and lack of time.
63	Agerstrom et al 2021 Sweden	**Research Paper** A retrospective multiple regression analysis study. Data extracted from Swedish LISA database	To examine SES disparities in In Hospital Cardiac Arrest (IHCA) treatment and survival. Assessing SES at the patient level and controlling other variables to assess impact of SES.	**Multi-professional** Cardiac Care	SES proxy used highest level of completed education and annual income.	**Yes**	Patients with lower SES, low income and low education were all significantly associated with more delay, and lower levels of immediate and long-term survival. People with high SES are more likely to have their heart rhythm monitored prior to the IHCA, despite having better health (less comorbidity). Heart Rhythm monitoring was significantly associated with less delay and increased immediate survival and 30-day survival.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
64	Bernardes et al 2021 Portugal	**Research Paper** Vignette: Drawing on a social psychological model of dehumanization. Two online experimental studies were conducted. vignettes/images depicting 2 cases of women with chronic low-back pain, followed by videos of them performing a pain-inducing movement.	To test the effect of patient socioeconomic status on pain assessment and management. Also, whether patient dehumanization and perceived life hardship mediated these effects.	**Multi-professional** Pain	SES was manipulated: level of education (incomplete high school education Vs degree) and occupation (factory worker Vs Judge).	**Yes**	Medical students: pain assessment was less comprehensive for low SES. They rated the low SES patient as having slightly lower pain intensity during movement but perceived her as more credible and with higher pain-related disability. Nurses: pain assessment was less comprehensive for higher SES. Nurses reported being slightly more willing to offer individualized care to the low SES patient. Lower SES patients were perceived as being more disabled by the pain.
65	Kirkham et al 2022 UK	**Editorial/Comment** A discussion about the Department of Health funded evaluation of the MIDIRS about Informed Choice leaflet. Stereotyping can be a defence mechanism which assisted midwives in coping with the pressures of work.	Midwives sometimes misjudged women's ability and willingness to participate in their maternity care and, therefore, women can be negatively labelled about things like housing tenure or social class [or age].	**Midwives** Maternity	Social class discussed	**NA**	SES stereotyping judgements affect Midwives behaviour. Low SES Women's silence reinforced the staff's perception that 'they don't want information.' It may also enable busy clinics to move at an 'efficient' and 'reasonable' pace.
66	Bruno et al 2022 Canada	**Research Paper** Prospective cross-sectional study from five primary care practices. A randomized controlled trial of a diabetes goal setting and shared decision-making plan.	To assess if SES is associated with empathic communication and decision quality in Diabetes Care.	**Multi-professional** Diabetes	Patient self-reported their ethnicity, education level and income prior to the trial.	**No**	Shared decision-making was not impacted by low education or income.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
67	Torres et al 2022 USA	**Review** Literature review	To assess implicit biases among healthcare providers, the influence of implicit biases on providers' medical judgments and communication, and the mechanisms by which this impaired patient-physician communication affects patients' health outcomes and disease prognoses.	**Doctors** Gynaecology Oncology	Paper discusses SES	**NA**	SES and insurance status impacts on unequal care and quality of care. SES associated with non-adherence to clinical guidelines.

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Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Scoping Review

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Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Scoping Review

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Abstract

Objectives

Research indicates that people with lower socioeconomic status (SES) receive inferior healthcare and experience poorer health outcomes compared to those with higher SES, in part due to Health professional (HP) bias. We conducted a scoping review of the impact of HP bias about SES on clinical decision-making and its effect on the care of adults with lower SES.

Design

JBI scoping review methods were used to perform a systematic comprehensive search for literature. The scoping review protocol has been published in BMJ Open.

Data Sources

Medline, Embase, ASSIA, Scopus and CINAHL were searched, from the first available start date of the individual database through to March 2023. Two independent reviewers filtered and screened papers.

Eligibility Criteria

Studies of all designs were included in this review to provide a comprehensive map of the existing evidence of the impact of HP bias of SES on clinical decision-making and its effect on the care for people with lower SES.

Data extraction and Synthesis

Data were gathered using an adapted JBI data extraction tool for systematic scoping reviews.

Results

Sixty-seven papers were included from 1975-2023. Thirty-five (73%) of included primary research studies reported an association between HP SES bias and decision-making. Thirteen (27%) of the included primary research studies did not find an association between HP SES bias and decision-making. Stereotyping and bias can adversely affect decision-making when the HP is fatigued or has high cognitive load. There is evidence of intersectionality which can have a powerful cumulative effect on HP assessment and subsequent decision-making. HP implicit bias may be mitigated through the assertiveness of the patient with low SES.

Conclusion

HP decision-making is at times influenced by non-medical factors for people of low SES, and assumptions are made based on implicit bias and stereotyping, which compound or exacerbate health inequalities. Research that focuses on decision-making when the HP has high cognitive load, would help the health community to better understand this potential influence.

Key Words

Socioeconomic Status, Implicit Bias, Unconscious Bias, Socioeconomic Disparities, Healthcare Disparities, Clinical Decision-making, Healthcare Professionals, Scoping Review.

Article Summary

Strengths and limitations

- This scoping review has a previously published protocol and has been conducted in line with international standards for best practice, to ensure rigor and transparency.
- The inclusion of a patient and public interest representative in the research team added quality to this review, by ensuring that the review is relevant, meaningful, and informed by the perspective of the people that access and utilise healthcare services.
- This work summarises the body of evidence in a clear concise manner, which highlights the patterns, advances, and gaps in what is known about this topic as well as the priorities for future research.
- Due to the nature of funding, only studies published in English were included and therefore this scoping review may have excluded relevant literature published in other languages.
- In keeping with the nature of a scoping review, the quality of literature collected was not evaluated.

Introduction

Socioeconomic status (SES), a social determinant of health, is a key causative and contributory factor to disparities and inequities in morbidity as well as mortality in many nations[1-3]. There is a wide range of robust empirical evidence from many settings which indicates that people with lower SES tend to have a shorter life expectancy and worse health related outcomes in comparison to more affluent people[1-4].People with higher socioeconomic status (SES) have better life chances, and thrive more than those in other socioeconomic groups[5-7]. The causes of the social gradient in health are complex, and the exact nature of the relationship is difficult to establish, because it is informed by both individual factors such as health behaviour but also factors associated with economic wealth[8-9]. The gradient in health and SES is also subject to a person's power, prestige, and the social connections they enhance[5]. Therefore, SES related healthcare disparities are influenced by how a person's SES is perceived by themselves and others[5,6].

There is evidence that suggests the care people receive is subject to Health Professionals (HPs) implicit bias arising from perceptions of patients with low SES[10]. Every person's thinking is shaped by lived experiences; interacting with people whose lived experience more closely reflects our own can lead people to using a favourable bias; just as unfavourable bias can be attributed to people whose life experience differs from one's own[11,12]. These biases are often subconscious or implicit and manifest in unthinking actions or ill-considered behaviours[11-15]. HPs are susceptible to multiple implicit biases relating to different characteristics such as SES, gender, weight, age, and ethnicity in their decision-making[11,12,16]. Implicit biases affect HPs decision-making about different aspects of patient care, such as diagnosis and treatment, often with deleterious consequences for the healthcare of that are minoritised, marginalised or othered[17]. HPs and patients hold implicit biases alike, which hinder the formation of a therapeutic healthcare relationship, patient experience, clinical decision-making, and care quality [9].

Aim

We sought to scope the reported impact of HP bias about SES on clinical decision-making and its effect on the care for people with lower SES in the wider literature. Our aim in this scoping review was to answer three related research questions:

- RQ1: What has been published about implicit SES bias and HP attitudes or behaviours when deciding and providing care?
- RQ2: How does SES effect the dynamics of the HP and patient relationship?
- RQ3: What recommendations for practice have been postulated, implemented, or evaluated to address HP implicit bias related to SES?

Operational Definitions

It is important to define key concepts at the onset of this work so that there is clarity about their use in this scoping review. Our operational definitions are summarised in figure 1 and are set out in detail with their underpinning rationale in our protocol for this scoping review[13].

Socioeconomic Status

SES is complex and challenging to define. Internationally, typically countries measure SES using Multiple Indices of Deprivation (sometimes called Multidimensions of Deprivation), which include economic factors such as income but also factors such as education, physical environment (sometimes known as neighbourhood quality), and health[13,18]. Papers will be included in this scoping review when the connection between SES of the patient (or one of its discrete measures, e.g., income, unemployment, education) and HP decisions is explored. There are some limitations to the use of discrete measures like income as proxies for SES, but it is prudent to include papers which include proxy measures of SES, as this is more likely to reflect the way healthcare professionals make decisions, as they encounter

people in their practice[13,19]. In other words, we assert that healthcare professionals are more likely to use discrete measures of SES, rather than more robust empirical measures to inform their perceptions of patients in everyday practice[17]. Therefore, we contend that it is apposite to include papers with discrete measures that may be limited in their utility as proxy measures of SES in this scoping review, because they offer useful insights into factors relating to healthcare implicit SES related bias(es) and how they affect HPs decision making about different facets of patient care in the reality of everyday practice.

HP Biases and Patient Care

Several systematic and scoping reviews[12,16,20] have explored the impact of HPs cognitive and other biases on patient care. However, only two of these systematic reviews[16,20] have focused specifically on the HP implicit bias and its impact on clinical decision making as well as the consequences for the quality, safety, equity, and appropriateness of patient care.

FitzGerald and Hurst's systematic review[16] explored HPs implicit biases relating to race/ethnicity, age, gender and SES, and indicate that biases are likely to influence diagnosis, treatment decisions and levels of patient care. Fitzgerald and Hurst's review[16] discusses evidence that social class may invoke more salient bias than bias associated with other characteristics such as race. Beyer[20] explored factors that influence treatment decisions in localised kidney cancer and found that education and socioeconomic status, were identified as barriers to HP making equitable treatment decisions.

Willems et al.'s systematic review[12] focuses on the impact of SES on doctor-patient communication, however this review does not consider decision making. Willems et al[12] found that patients with lower SES had a less positive dialogue with their doctor, characterised by lower levels of information giving, less interactive discourse and a lower level of doctor advice/instruction.

Bias and Decision Making

Biases can be explicit, implicit, favourable, or unfavourable, but regardless of form, it is an impediment to judging others fairly, which undermines safe, just, and equitable healthcare[11,16,21-23]. Explicit bias occurs when the individual has conscious thoughts, beliefs, and awareness that they evaluate people differently based on their characteristics, these evaluations consciously influence their behaviours and decision making[8,9,11,24]. In contrast, implicit bias is subconscious, and the individual is unaware of its influence on how they affect, cognition, behaviours, and decision-making[24,25,26]. Consequently, there is a more deliberate, volitive, and intentional process to decision-making when explicit bias is at play in contrast to the tacit, covert, unintentional nature of the relationship between implicit bias and decision-making[11,16,23].

Implicit and explicit bias are kindred but independent constructs which raises some methodological challenges and considerations with regards to their measurement[13,21]. Explicit bias relates to thinking that people are aware of and so can be measured through self-report, but there is the risk of people providing socially desirable responses[21]. The subliminal nature of implicit bias requires a different approach to surface and measure it given its multifaceted impact on a person's affect, cognition and behaviour[21]. The Implicit Association Test (IAT) is the most established way of measuring implicit bias and has strong psychometric properties in comparison to other implicit measures[21,27-30]. Therefore, it is important to briefly consider its strengths and limitations.

Implicit Association Test

The (IAT) is a validated measure of implicit bias and with strong psychometric properties in comparison to other tools[30,31]. A consensus exists among researchers with regards to the IAT's lacks of a high test-retest reliability in the same individual[16]. However, the construct validity of the IAT, as well as its efficacy as a measure of implicit bias, especially as a predictor of real-life behaviour in the context of everyday life is contested[16,21,30,32]. Concerns relating to the predictive validity of the IAT persist among some researchers, progenitors cautioning against its use to forecast what people will do, or not do, and behave as they go about their lives, given the vicissitudes of human

existence with their concomitant, contingent events that intersect in complex, unexpected, emergent ways to impact on an individual's affect, actions and behaviour[16,30]. Conversely, others[30,32] maintain that implicit and explicit measures of bias are not superfluous but have their merits in informing predictions about human behaviour in different ways that are distinct from each other. Despite this lively debate about the relative merits of IAT, it is most widely utilised measure of implicit race and ethnicity bias in healthcare[16,31,33]. One view is that there is specious evidence of the predictive validity of the IAT with regards to implicit racial bias[30,34]. This characterisation of the IAT's utility in establishing implicit racial bias is strongly disputed by many others[30,35,36], who have a different understanding and conclusions predicated on the same data set. There is also evidence from a systematic review[37], which highlights the limitations of the IAT in establishing multiplicative effect of several biases that intersect across multiple social identities.

Our approach

A better understanding of the impact SES has on HP patient related decision-makings arguably will provide a valuable new focus in tackling socio-economic health inequalities[8,9,12]. Therefore, it is imperative to undertake a scoping review that maps all pertinent evidence, integrates contemporary knowledge about this topic, clarifies key concepts, sets out evidence-based recommendations for practice and identifies the priorities for future research. In our view, it is essential that the scoping review should map all available research on implicit SES related bias regardless of the research method used. Several scoping reviews[24,33,38] have highlighted the valuable insights into implicit bias and its impact on HPs decision-making that can be gained from studies that use other research methods such as case study vignettes, questionnaires, think aloud interviews, randomised controlled trials and qualitative methods. This evidence from other scoping reviews underscores the aptness of our decision to include all studies that met our inclusion criteria as stated in detail in our a-priori protocol[13], regardless of the methodological approach used. Debates about methodological rigour in relation to implicit bias should not be an impediment to use every means to better understand and address its pernicious impact on HPs clinical decision-making, often culminating in inappropriate or discriminatory care that gives rise to adverse event, causes harm, offence and negatively impact people's healthcare related outcomes. In sum, any scoping review that considers implicit bias in healthcare has an obligation to include all studies so the best possible relevant research evidence to inform and underpin the consistent delivery of safe high-quality, just, and equitable healthcare.

Method

We conducted a scoping review using JBI methodology[39,40] as set out in our a-priori published protocol[13], and report our results in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Protocols and Scoping Reviews (PRISMA-ScR) guidelines[41,42]. A detailed account of methods used in this scoping review is provided in our a-priori published protocol[13], which has granular details about key elements such as the search strategy, inclusion/exclusion criteria which can be replicated. Therefore, we present a concise summary of the conduct of this scoping review in line with best practice reporting to avoid undue repetition.

Patient, Public Involvement

This scoping review [and it's previously published protocol] has been developed with a member of the public (BA). The design of this scoping review draws upon BA's personal experience of living with, and beyond a cancer diagnosis, which entails regular contact with health services and healthcare professionals. Therefore, BA's lived experience and perspective has directly shaped the design, results, discussion and implication sections of this work.

Search strategy and data sources

Our literature search was carried out in three stages. In the first stage, an initial search was undertaken on Medline to identify and refine search terminology and consider Medical Subject Headings to ensure a comprehensive strategy that selected all the relevant papers published related to SES and its impact on health care. The Medline search strategy was tested, and the first 100 references scanned by three authors (AC, CJ, and RS) to ensure relevant papers were retrieved. Key papers were checked to confirm they were being retrieved by the search. In the second stage of

the search process, the Medline search strategy was adapted for use on other key databases (Medline, Embase, ASSIA, Scopus, CINAHL) to account for differences in controlled vocabulary and database functionality. We also searched the website of key organisations such as professional regulatory bodies, think tanks and policy making bodies for any pertinent publications. In the final stage of the literature search, we conducted back and forward chaining of included papers to identify any other relevant documents. All searches have been updated since the initial search date, of 21st October 2021 and are up to date as of 9th March 2023. Please see Supplementary Materials 1 for the detailed search strategy, and our a-priori published protocol[13] for more information.

Screening and selection process

All retrieved citations were exported to the Rayyan systematic review software package and duplicates removed. In the first filter, the titles, and abstracts of the included papers were assessed against the inclusion criteria and independently filtered by two members of the project team (CJ and RS). Any differences with regards to the inclusion or exclusion, were resolved through discussion and after reviewing the full text of the papers in question. In the second filter, the full text papers were assessed against the inclusion and exclusion criteria. Our population, concept, context and design criteria are set out in Table 1, as per our protocol[13]. We only included publications in English as this was an unfunded study with no facility for translation[13]. Studies of all designs were included in this review because our focus was on mapping the evidence about the impact of HP bias of SES on clinical decision-making and its effect on the care for people with lower SES. Please see the search strategy in supplementary material 1 for a full list of search terms used in relation to SES.

Table 1: Identification the Population, Concept and Context and Design

Population	Concept	Context	Design
• HPs working in any healthcare setting including: ✓ Doctors ✓ Nurses ✓ Physiotherapists ✓ Occupational Therapists ✓ Speech Language Therapists ✓ Midwives ✓ Mental Health Professionals ✓ Pharmacists	• Socioeconomic Status (SES) • Papers that discuss discrete measures of SES as defined in the operational definitions.	• HP decision making when it interacts with bias of SES.	• Research studies of all designs that include primary data. • Case studies • Editorials • Opinion papers

Data extraction and charting

Relevant data were gathered using an adapted version of the JBI data extraction tool systematic scoping reviews[43], that was converted to an Access Database form (please see Supplementary Materials 2 for the adapted JBI data extraction form). This Access database form was tested on the first five papers and then adapted as per JBI guidance to gather all information pertinent to the review questions[43]. On completion of data extraction, the data was exported to an Excel spreadsheet to facilitate data analysis. Our mapping and reporting of the data was also informed by the lived experience and perspective of the patient and public interest representative on our team (BA) as stated in our protocol[13] and consistent with best practice in systematic reviews[44].

Results

Selection of sources of evidence

The PRISMA flow diagram below (Figure 2) summarises how we searched for relevant publications and selected literature for inclusion, in line with best practice in scoping reviews[45]. Data analysis, interpretation, and reporting will be underpinned by the PAGER framework[46].

Summary of characteristics

The 'Characteristics of Included Publications' are presented Supplementary Materials 3. In our search strategy, we purposively cast a wide net to capture all relevant published papers, because of the complexity of defining SES and in total, we screened 11823 publications across different decades. At first filter, 11281 'off topic' papers were excluded, such as those concerned with children, dentistry, HP career development or focused on SES but not HP decision-making. We selected publications that considered HP decision-making from the HP's viewpoint and excluded papers that explored HP decision-making from the patient perspective.

We reviewed 542 studies for eligibility and retained 67 publications for inclusion in the scoping review. Seventy papers were retained for background reading and synthesis, because they provided broader insights about the relationship(s) between stereotyping, bias, and SES. We included a wide range of publications in this review. Forty-eight of the 67 included papers (72%) reported on original research, while the remaining papers were commentaries or opinion pieces (n=15) and reviews (n=4) about aspects of SES and HP decision-making. Most included papers, were from the United States of America (67%; n= 45), followed by the United Kingdom (10%; n=7), Canada (6%; n=4) and Portugal (3%; n=2). Two papers involved authorship across national boundaries, and these were labelled as international (3%; n=2). The remaining included papers included involved a single published paper from Denmark, Finland, Mexico, New Zealand, Norway, Sweden, and Pakistan.

The earliest published included research paper retained was by Crane[47] in 1975, who explored the impact of social factors and physiological criteria in HP treatment decisions about critically ill patients. Crane[47] explored doctor decision-making using case histories and questionnaires; she discovered that there were disparities in doctors' decision-making between a patient with a high-status occupation and another patient described as an unemployed labourer. Doctors in this study[47] offered more aggressive treatment options to people with high status occupations, even though they explicitly stated that they did not rate social status highly in their decision-making process. Crane[47] did not categorise this finding as implicit bias, which may reflect the prevailing socio-cultural beliefs at the time this study was conducted. However, in our view, this finding by Crane[47] is an example of implicit bias and the earliest research study we found. We also noted that from 2008 onwards, there was at least one publication about bias in relation to SES that met the inclusion criteria for this review. The increased frequency of publications from 2008 onward maybe a consequence of the emergence of the Fundamental Causes Theory[3] and a greater understanding of socioeconomic disparities in English healthcare provision facilitated by the Marmot Review[1].

Types of publications

The results of this scoping review highlighted various aspects of what has been published about implicit SES bias and HP attitudes or behaviours when deciding and providing care. Firstly, most of the 67 publications included in this scoping review were original research studies (n=48, 72%), with the remainder being reviews, commentaries, and opinion papers (n=19, 28%). This indicates that there has been a greater focus on building the evidence on this topic by focusing on conducting primary research relative to preparing other types of papers which provide useful and complementary insights. An alternative perspective to consider is that publications such as commentaries, opinion papers, and editorials often contain useful tacit insights and wisdom that constitute *'fugitive knowledge'* or *'soft intelligence'* as they exist beyond formal knowledge structures, because this information is risky to know and share with others through conventional mechanisms[48,49]. Therefore, these valuable insights are challenging to establish and understand using conventional research approaches. So, they may be scope to encourage the publication of different types of papers on this topic to facilitate a better understanding of how the SES related perceptions, views, or beliefs of a HP impact on their clinical decision-making in a manner that reflects the reality of healthcare which is delivered in complex adaptive systems.

Geographical location

Many of the papers in this scoping review were authored by people based in the global north, specifically North America and Europe from 1995 onward (n=61, 91%), with the remainder being written by an international team of authors or people based in other parts of the world. This may be an indication of the impact that seminal publications such as the Fundamental Causes Theory[3] and Marmot Review[1] have had in highlighting the relationship between lower SES, health inequalities and poor health related outcomes in these parts of the world. It is also possible that the higher number of publications in these regions may reflect that there is greater scope to access funding for research on the relationship between implicit SES bias and HP's clinical decision-making within these settings. Then, it would be apt for more multinational research on the relationship between implicit SES bias and HP's clinical decision-making within especially those that are low and middle income, or described as developing and transitional, so there is a better understanding of this issue across nations especially those that are in the global south.

Health Professionals

Thirty-one[9,18,19,25,28,47,50-74] of the forty-eight research papers reported on implicit bias in relation to Doctor/Physician clinical practice. The remaining papers explored or discussed decision-making from a multi-professional viewpoint (n=6)[75-80] and this included doctors, nurses or midwives working in multidisciplinary teams. Four research papers[29,81-83] explored nurse bias and decision-making, four involved medical students[27,84-86] and two papers[87,88] explored potential bias and decision-making of Psychotherapists/Counsellors. One study[89] was concerned with Occupational Therapists. The implicit bias in nurses and allied health professionals' practice is more evident in recent research studies which may reflects their increasingly central role in clinical healthcare decision-making. We found no studies that explored implicit bias in Pharmacists' decision making. This was a surprise as clinical decision-making is a fundamental aspect of pharmaceutical practice especially in settings such as the UK, where pharmacists have extended roles as non-medical prescribers and must be able to assess, diagnose, and treat patients[90,91,92,93].

Research Methods

Included primary research papers employed several different methodological approaches. Most research papers (50%, n=24) used a vignette approach[19,25,27-29,44,47,51,53,54,57,60,64,67,68,71,72,79,82-84,86,88,89], and some combined the vignette approach with the Implicit Association Test (n=6)[27-29,67,68,72]. Some studies used prospective data collection (n=2)[29,80], High Fidelity simulation (n=1)[85], retrospective data review (n=3)[62,69,78] quantitative survey/questionnaire (n=8)[9,47,56,61,66,68,81,87], qualitative interview (n=10)[52,55,58,63-65,70,75-77], or a qualitative observational approach (n=2)[65,76]. Vignette studies illustrated the clinical scenario through a video recording (n=11)[19,25,44,51,53,64,71,79,82,83,88] while others used a combination of written case examples and written scenarios with pictures depicting the clinical cases (n=13)[27-29,47,54,57,60,67,68,72,84,86,89] Representations of SES were indicated based on appearance of the patient, such as how they dressed and/or the description of the person which indicated their occupation. In studies that retrospectively or prospectively examined health data, health insurance status, or area level deprivation measures were applied to patient demographic information to measure the SES of the population.

SES and HP Decision-making

Thirty-five of the forty-eight included primary research studies (73%) reported an association between SES and HP decision-making[9,18,19,47,51,52,54-58,60,62-66,68-73,76,77-79,81,82,83-87]. Meaning that in over two-thirds of the research papers reviewed HP decision-making about assessment, investigations, treatment, or care was influenced by a person's socioeconomic status. Thirteen papers did not detect any SES related bias in HP decision-making[25,27-29,44,53,59,61,67,74,80,88,89]. There were no discernible patterns or trends in the characteristics of these 13 papers, which used a variety of methodologies, involved different HPs across a range of specialty settings. Interestingly, four papers by Haider et al.[27-29,67] did not find a link between SES and decision-making, but detected high levels of implicit

favourable bias towards people with high SES, in doctors[28,67], nurses[29] and medical students[27]. All these studies[27-29,67] combined the Implicit Association Test (IAT) and a vignette-based approach to assess the impact of implicit bias on decision-making. Three of these studies reported that 90.7% of doctors (n=215)[28], 93% of nurses (n=245)[29] and 86% of medical students (n=211)[27] demonstrated an implicit preference toward people with High SES. However, in these studies[27-29], the high levels of implicit SES bias were not evident in HP's decision-making. This result suggests that not all implicit bias leads to disparities in decision-making.

Table two displays the research that links SES and decision-making by professional group. Three quarters of the research papers demonstrate a link between SES and decision-making in doctors (n=23)[9,18,19,47, 51,52,54-58,60,62-66,68-73], medical students (n=3)[84-86] and nurses (n=3)[81-83]. Five of the six studies with multi-professional participants demonstrated a link between SES and decision-making (n=5)[75-79]. There was not enough data within the included studies that focused on Occupational Therapists and Psychological Therapists, to draw any meaningful conclusions about the relationship between implicit SES bias, and their decision-making (Table 3).

Table 2: Link between SES and HP decision-making per professional group (research papers)

Professional Group	Link found	link found %	No link found	No link found %	Grand Total
Doctor	n=23	74%	n=8	26%	n=31
Medical student	n=3	75%	n=1	25%	n=4
Multi-professional	n=5	83%	n=1	17%	n=6
Nurse	n=3	75%	n=1	25%	n=4
Occupational Therapist	n=0	0%	n=1	0%	n=1
Psychological Therapist	n=1	50%	n=1	50%	n=2
Grand Total	n=35	73%	n=13	27%	n=48

In our included research publications, we identified that there were some medical specialities in which there were three or more research studies exploring SES related implicit bias in HP decision-making (see Table 3). Every included study (n=7; 100%) on pain assessment and/or management[60,71,72,79,81-83] reported a link between decision-making and SES. In obstetric/contraception care 80% (n=4) reported a link between implicit SES bias and HP decision-making[62,75-77]. More than three quarters of the studies involving cancer care (n=6; 86%)[19,51,57,69,70,84] and all but one study (n=7; 87.5%)[9,18,55,56,68,78,85] exploring coronary heart disease (CHD) detected disparities in HP decision-making related to SES. Three of the nine papers that explored multiple conditions detected a link between SES and decision-making[58,65,66]. Two of the included research papers on diabetes[64,65] and one in mental health[87] found a link between SES and decision-making. The two studies exploring SES and decision-making in trauma care did not detect a link between SES and decision-making[28,67]. For the other specialities listed in table five a single research paper was included; asthma[73], dermatology[63], kidney transplantation[52], palliative care[47] and sickle cell disease[86].

Table 3: Link between SES and HP decision-making per specialty (research papers)

Condition	Link Found	Link Found %	No Link found	No Link Found %	Total
Cancer Care	n=6	86%	n=1	14%	n=7
Multiple Conditions	n=3	38%	n=6	62%	n=9
Coronary Heart Disease	n=7	86%	n=1	14%	n=8
Pain Assess/Management	n=7	100%	n=0	0%	n=7
Obstetrics/Contraception	n=4	80%	n=1	20%	n=5
Diabetes	n=2	67%	n=1	33%	n=3
Mental Health	n=1	50%	n=1	50%	n=2

Condition	Link Found	Link Found %	No Link found	No Link Found %	Total
Trauma	n=0	0%	n=2	100%	n=2
Asthma	n=1	100%	n=0	0%	n=1
Dermatology	n=1	100%	n=0	0%	n=1
Kidney Transplantation	n=1	100%	n=0	0%	n=1
Palliative Care	n=1	100%	n=0	0%	n=1
Sickle Cell Disease	n=1	100%	n=0	0%	n=1
Total	35	-	13	-	48

Discussion

As far as we are aware, this scoping review is the first to scope wider literature about the reported impact of HP SES related bias on clinical decision-making, through a comprehensive and systematic search of all the available evidence. This pioneering scoping review has generated key insights into what has been published about HP implicit SES bias, and how it affects HPs attitudes or behaviours as they make decisions about the provision of care for patients. In addition, this scoping review has also revealed how SES can affect the interpersonal dynamics of the HP and patient/service user in their relationship during care delivery. The insights that have been generated from the scoping review can be used to inform efforts to ensure that everyone receives safe high-quality, person-centred, evidence-based care in a just and equitable manner from every HP that they encounter. We begin our discussion by focusing on the salient points from the results relating to HPs, research methods and measures of SES. This progresses into a tightly focussed discussion of our results aligned to each research question in relation to wider literature.

Types of HP

It is worth noting that just under two thirds (n=31)[9,18,19,25,28,47,50-74] of research papers on HP SES implicit bias and decision-making focused on doctors/physicians, with significantly less studies focusing on interprofessional or multidisciplinary teams (n=6)[75-80], nurses (n=4) [29,81-83], and medical students (n=4) [27,84-86]. The number of papers exploring decisions made by non-medical HPs gains interest in the literature after 2008 and reflects the changing landscape of healthcare decision-making, and the extended role of Nurses and Allied HPs. The lower number of research papers exploring decisions made by non-medical HPs may also be an indication of the perceived importance of different healthcare professionals in patient care by those who fund research. The empirical evidence at hand indicates that more is known about doctors/physicians' implicit SES biases and its consequences with regards to their decision-making than other professions. Given the global shift toward more plural approaches to healthcare delivery in which other HPs have extended roles, such as non-medical prescribing, there needs to be greater focus in future research that explores any link between SES and decision-making of other professionals in healthcare and its consequences for patient care.

Research Methods

Our results indicate that the association between HP implicit SES bias and their decision-making has been examined using a variety of different research methods. However, half of the studies (50%; n=24)[19,25,27,29,44,47,51,53,54,57,60,64,67,68,71,72,79,82-84,86,88,89] utilised a vignette approach which used a video recording, or combined written case exemplars, scenarios, and images of different types of people. Some studies (n=6)[27-29,67,68,72] used the Implicit Association Test (IAT) to gather data regarding the participants' favourable bias as a precursor to vignette examination of decision-making. Regardless of the research method used, in most studies, the information provided to the participants with regards to SES was predicated on the patient's visual appearance such as the clothes that they were wearing, or how they were described which provided an insight into their profession, and or education.

Given the preponderance of vignetted based research on this topic, it is prudent to consider its utility in understanding HP decision-making. Vignette studies are adept at establishing judgement and decision-making in a variety of professions, which have a high level of applicability and generalisability about how HPs undertake their work on a day to day basis[94-95]. In addition, vignette studies are an effective way of exploring people's beliefs, perceptions, attitudes, behaviour, and biases[95-98]. However, the utility of this approach in decision-making studies is contingent on the researcher's ability to craft and word a written or visual vignette that reflects the complex nature of reality, and that sets out key information in line with best scientific practice[94-96,99]. A key issue with the use of vignettes in research is that the information that they contain and convey, may subconsciously relay, or reflect the researchers' own perspectives and/or biases, which may influence the information they provide, as well as how they describe others in the scenarios that they create. Hence, it is widely recommended that the vignettes are evidence-based, reviewed by expert peers, or patients, and subsequently pilot tested to ensure that they are valid, culturally appropriate, and clear before they are used in a study[94,96,100]. Equally, others[101] have opted to co-create vignettes with members of the population they research to ensure that they are culturally relevant, utilise the appropriate terms, and convey the perspective(s) of the people who are being characterised therein.

There is scope for the greater use of other research approaches such as high-fidelity simulation, prospective data collection, qualitative interviews, qualitative observation, quantitative surveys or questionnaires, and retrospective data reviews in studies on this topic. Conducting future research which uses some of these less commonly used approaches, on their own or in combination may shed new light on hitherto unknown or overlooked aspects of HP implicit SES related bias. This is particularly important as each research method has its own strengths and weaknesses, so using a combination of different approaches facilitates data triangulation, which can lead to more meaningful insights, enhance methodological rigour, and help to draw more robust conclusions from the data.

Measures of SES

When developing the protocol for this study we made the decision to include poxy measures of SES and in retrospect this was an important decision. When exploring HP decision-making a number of proxy measures or indicators of SES have been utilised in the included research papers. Included papers used poxy measures such as occupation/Employment (n=15)[25,27,29,47,53-55,65,68,71,72,81,84,85,89], Education (n=14)[9,28,52,58,59,61-63,70,78-80,82,89], Income/Finances (n=11)[9,18,57,69,71,72,74-76,78,80], appearance/dress (n=7)[19,25,53,64,83,85,88], Health Insurance (n=3)[18,19,56]. A Formal SES or deprivation measure was used in only three of the studies included in this review[9,66,69]. We are aware that the inclusion of papers with single discrete measures such as these may be contested from a social science perspective, as SES is invariably multifaceted and complex[17]. A comprehensive discussion about the utility or otherwise of different discrete or proxy measures is beyond the remit of this paper, but there are some constraints to the use of some discrete measures such as income as a proxy for SES. The results of this scoping review support our view that proxy measures for SES, albeit with their limitations, can provide useful insights into HP implicit bias and its consequences for their clinical decision-making about patient care[17]. Therefore, by mapping the different methods that are used to measure and report SES in different types of publications, it is hoped that there is a clear overview of how they have been utilised in different contexts.

RQ1: Bias and Stereotyping

HPs make different judgements or decisions about assessment, treatment and care based on who the patient is, as opposed to what they present with[64]. Three examples of this are highlighted below drawing on the evidence pertaining to pain assessment/management, maternity/contraception care and cardiac care. Wilson[81], Anastas[72], and Brandao et al.'s[82] studies highlight stereotyping as an influence in HP behaviour and decision-making. Brandao[82] reported that people with low SES were viewed as less credible during pain assessment by a HP. Anastas[72] and Wilson's[81] studies both found that people with low SES were often viewed as being untrustworthy and incapable during pain assessment, which led to disproportionate concerns about possible opioid addiction and triggered 'gate keeping' behaviours in the HP and this affected pain management decisions. Stereotyping and bias were also reported in maternity and family planning studies[65,76,77]. Manzer[77], Smith-Oka[76]and Shawahna's [65]

studies identified the adverse impact of stereotyping on HPs assessment and decision-making. In these studies HPs considered women with low SES to be untrustworthy, bad mothers and/or promiscuous, as well as lacking capacity to make sensible decisions about planning future pregnancies[65,77,76]. Manzer[77], Smith-Oka[76] and Shawahna[65] studies also reported that women with low SES were subject to biased disparities in advice, guidance, and management that nudged women toward using longer term (and on occasions irreversible) contraceptive options. Agerstrom et al[78] found that people with low SES were more likely to receive delays in cardiac arrest care compared to patients with higher SES. In this study[78], the results revealed that highly educated patients (P <0.001) and patients with higher income (P = 0.001) were significantly more likely to have their heart rhythm monitored prior to the onset of the cardiac arrest (holding all other variables). Heart rhythm monitoring was significantly associated with less delay, shorter duration, increased immediate survival and 30-day survival[78]. In this instance, SES related discrimination was associated with HP decision-making about who gets cardiac monitoring, which impacted on timely cardiac arrest care and patient survival. Goddu et al.'s[86] study highlights that perceptions and stereotyping amongst HPs can be triggered prior of in-person meetings with patients through language and words used in medical records or referral letters. This suggests that SES related stigma and bias can unwittingly be transmitted among HPs through the words and language that are used to characterise the person receiving care as well as to describe their lived experience. Therefore, the words, terminology, and language in reference to the people seeking or receiving care seem to be a key influence and, in some cases, a predeterminant of HP attitudes and behaviour that can adversely affect clinical outcomes.

Social psychologists describe two fundamental dimensions of social perception when considering bias and stereotyping that help us to understand how people see each other[102]. The stereotype content model (SCM) was first proposed by Fiske[103,104] and provides a theory that explains how individuals form impressions, assumptions, and judgements of other individuals or groups based on their perceived warmth or capability. This theory is useful when making sense of the biases that might be impacting on HP interaction with patients and when making decisions [102]. The first dimension of the SCM relates to the **warmth** of a person, for example, how friendly or trustworthy they appear to be[103]. A person who is cooperative is deemed warm, and a person who is perceived as resistant is perceived as cold[104]. The second dimension relates to the **capability** of the person, for example, how skilled, intelligent, or competent they appear[103,104]. Warmth is evaluated first because it predicts future behaviour; capability is judged more slowly as it reflects the other person's ability to act competently[26]. In terms of SES or social class, for example, wealthier people are stereotyped as intelligent and better educated, therefore more capable than poorer people of lower SES or class[26]. SES can be signalled in many ways, the way a person dresses, their mannerisms or their accent, and these cues lead to behaviour changes that impact on the interaction between people[26]. The interaction between people is a dynamic process in the context of healthcare, so HPs make conscious and subconscious judgements about the other person, while simultaneously, the person seeking, or receiving healthcare makes similar judgements about the HP, this is then manifest through dialogue and influences how they see each other. Stereotypes do not need to be consciously recognised to generate discrimination, they can be subconsciously held, and triggered in such a way that people use them to frame their actions and to rationalise what they do, or do not do, in an automatic process with little or no thought or self-awareness[105]. Consequently, SES related stereotypes seem to be a contributing factor that maintain health inequalities, given that HP decision-making appears to lead to unwarranted variations in care and treatment[64].

Time and cognitive load

A recurring theme is the reported influence of HP workload on implicit bias and decision-making. There is evidence to suggest that HPs rely on implicit messages to 'fill the gaps' in comprehensive assessment when time and effortful thought are limited or prevented. Several papers[11,75,106,107] suggest that the contribution of cognitive load, stress and limited time-restraints impact on the HP's motivation to suppress implicit bias when making decisions. Self-awareness of one's own prejudice and bias is important when making decisions, but self-awareness is diminished when the HP is busy and does not have sufficient head space to mitigate the impact of potential implicit bias[108].

Decision-making is ideally a controlled process which involves making intentional, conscious, and effortful thought[108]. However, if the HP is engaged in high levels of mental activity, is stressed or has limited time, then this can interrupt, impair or prevent a controlled thoughtful decision[108]. In these circumstances stereotyping is used as an energy saving mechanism that allows for intellectual shortcuts in decision-making that feel comfortable because they fit with what we think we know[11]. Therefore, HPs are less patient-centred in these circumstances and the unique features of the patient (which are discovered during comprehensive assessment) can be replaced with stereotypical patterns based on the patient belonging to a certain social group/s[11,107,108]. Brown[75] discovered that HPs took greater effort to ensure the confidentiality of the HIV diagnosis was protected for women with high SES. The HPs in the Brown study[75] considered confidentiality to be less of a priority for the women with low SES because their social position was less important. Brown[75] discovered that this bias tended to be activated when staff were overburdened and/or where health services were poorly resourced. There is also evidence that shows stereotyping can assist in coping with the pressures of HP practice[109]. Spending less time with patients with low SES may be perceived as helping to 'move clinics along,' because of the HP assumption that some people will not need as long as other people in clinic. Patients with low levels of SES, can often be viewed as needing less information because of an assumption they do not wish to be informed, because they ask less questions or because they do not have the capacity to retain information, and this assumption actually helps the clinic to regain lost time[109].

Intersectionality of SES and other factors

Intersectionality refers to the interactivity of different social identity structures such as race, class and gender, and how belonging to more than one social identity group can have a greater negative effect than belonging to one group alone[16,110]. Our results show that intersectionality can have a powerful cumulative effect on HP assessment and subsequent decision-making. Stereotypes and prejudices are stackable and the proclivity towards discriminatory attitudes, tendencies, and behaviours rises as perceived vulnerability of the person seeking or receiving care increases[16]. Denburg et al[57] explored race and social vulnerability for men with localised prostate cancer and discovered that the higher the perceived patient vulnerability by the HP, the more likely they were to opt for 'watchful waiting' as opposed to active treatment. For example, men who were deemed to have a low income, were widowed, or were characterised as being black by HPs, were the least likely to be referred for radical prostatectomy. McKinlay[18] explored non-medical influences on HP decision-making for patients with coronary heart disease and found that discriminatory attitudes and behaviours were linked to the patient's age, perceived level of income, and insurance status. Older adults with low income and without medical insurance were less likely to receive a primary cardiac diagnosis, however this discrimination did not affect younger patients who were low income and without insurance[18]. Fitzgerald's[16] systematic review which explored implicit bias in healthcare professionals, highlighted how perceptions relating to race, SES, and gender intersect, but also interact in complex ways. The intersectional interaction between different factors is arguably a reflection of the continuous nature of perceived warmth and capability matrix as previously described in the SCM, but the outcome for the patient can be bleaker when racial and class biases stereotypes overlap[26]. Our results about the complex intersection of SES and other factors such as race are consistent with wider evidence from other studies. For example, there is evidence which shows that controlling for SES, people who are of Afro-Caribbean heritage are three times more likely to be diagnosed with diabetes than their counterparts of European heritage, while people who are Lesbian, Gay, Bisexual, Transgender or identify as Queer are more likely to have multiple risk for cardiovascular disease than their heterosexual peers[4]. The evidence collected on intersectionality in this review demonstrates the importance of multivariable reviews of implicit bias, therefore exploring SES, race, age, or gender as individual factors in isolation will not tell the whole story. Instead, the intersectionality the distinctive characteristics, and traits that a person has as well as the social groupings that they belong to must be considered, especially given their complex interactions and cumulative effect on the care of patients is the correct way forward when we seek to understand patient experience.

RQ2 *SES and HP Decision-making*

Dialogue plays a key role in how we see each other[111]. Initial impressions of both the HP and patient can be corrected through interaction between both parties[112]. Initial impressions of warmth and competence can be adjusted through dialogue during the assessment and decision-making process. This interaction however requires motivation for one or other party[51]. A motivated HP who offers more time, seeks the input of the patient, and consciously considers equality and/or equity can build a dialogue with the person based on 'what matters most to them'[103]. In the same way a patient who demonstrates existing knowledge and has an active or assertive manner in dialogue with the HP can influence the HP decision-making by altering the HPs assumptions related to the warmth or competence of the patient[51].

Manderbacka[55] exploration of decision-making in relation to 'white collar' and 'blue collar' patients found that doctors were more likely to take a 'doctor-centred model' for communication, assessment and decision-making with patients from a 'blue collar' background, but tended to adopt a 'person-centred and shared decision-making model' with 'white collar' background patients. It is not always the case that a person who is inferred as capable is automatically also perceived as warm on the SCM matrix[113], in fact some research has shown that when a person is viewed as capable and competent then the perception of warmth is viewed less positively[102,103,113]. This can mean that when a patient is perceived as lacking capability or competence then their warmth can be viewed more positively as a compensatory effect, which in turn triggers a greater paternalistic behaviour from the HP, that effects their communication style and quality[113]. Castaneda-Guarderas et al[114] and Krupat et al[51] assert that the perceived power differential between the HP and the patient can inhibit shared decision-making because it negatively effects patient trust[114]. Patients are less likely to participate in dialogue and shared decision-making if they perceive the HP as judgemental, in this way HP bias can trigger the patient's bias in a dynamic way, adversely affecting dialogue and patient centred care[51].

Patient assertiveness can lead to more careful diagnostic testing for people who may have been otherwise disadvantaged because of their SES (56). Barnhart et al[56] explored non-medical reasons for disparities in coronary heart disease treatments and discovered that if patients with low SES adopted a health assertive manner, then their treatment recommendations (revascularisation) more closely mirrored patients who had high SES. Krupat et al[51] explored the effect of patient assertiveness in HP decision-making for older adults with breast cancer and similarly discovered that patients with low SES were more likely to have full staging of their cancer investigated when they made assertive requests. In both these studies[51,56] patient assertiveness led to more careful diagnostic testing for people who may have been otherwise disadvantaged because of their SES. Therefore, there is empirical evidence which suggests that implicit SES bias can manifest itself in HP-patient behaviours that impede relationship building, which could be mitigated with greater HP self-awareness and greater patient assertiveness[51,56,111]. Further research is needed to explore the impact of patient assertive requests on HP decision making. It is increasingly recognised any such improvement efforts that seek to address health inequalities, such as those caused by HPs implicit SES bias, must involve meaningful co-production and dialogue about health inequalities that enables and empowers people to have agency and to take action[115].

RQ3 *Measures to address HP implicit bias related to SES.*

We integrated a range of recommendations from included publications into three main themes: further research, education/training and policy, and guidelines. The reviewed papers highlight the need for further research to explore in more detail the reasons and mechanisms in which social factors affect and influence HP decision-making[54,55,59,61,63,69,72,73,82]. There is a gap in understanding mechanisms that prevent or inhibit the implicit judgment surfacing as explicit actions, particularly related to HP time and cognitive load[61,108]. Hence, this gap in understanding is a key priority for any future research and improvement efforts that seek to address HPs SES related decision-making and its negative impact on patient care.

Another recommendation arising from the reviewed papers is the exploration of education and training for both HPs and patient groups which seeks to increase HP self-awareness through perspective taking and/or help patients with health literacy and assertiveness[9,51,56,60,68,70,71,76,77,82,84,85]. There appears to be a gap in the evidence that requires further exploration, specifically, there are as yet unanswered questions about how training can successfully raise awareness of SES bias, and how the impact of this training on clinical practice can be assessed or evaluated in the short term and longer term[116]. The impact of health literacy education on SES related bias is outside of this scoping review, but moving forward, it would be prudent to consider how health literacy and assertiveness education with patients might help facilitate more active participation for patients with low SES, which may have a role in reducing health inequalities[56].

Policies, guidelines, and best practice statements, which recognise the impact of SES on HP decision-making are needed to guide the HP when making decisions that inevitably include non-medical factors[58,70,75]. A smaller number of papers recommend that any such policies, guidelines, and best practice statements should be constructed with mindfulness of implicit bias[75,117]. Implicit bias needs to be explicitly discussed and integrated into the policy and guidelines that help to shape HP interactions and patient experience. There is evidence of this work is happening to help support people of global majority heritage who are minoritised because they are categorised as non-white[118]. This work must be expanded to include SES related bias, given its pervasive nature, as well as its complex interaction and intersection with race in relation to patient care.

Strengths and limitations

This scoping review has its limitations which must be given consideration. Most included publications are from North America and Europe in the global north, therefore the relevance of its results to other parts of the world, especially those that are part of what is increasingly referred to as the global south is limited. The fact that only articles published in English were included, means that relevant works in other languages will have been omitted from this review. Consequently, the result of this scoping review provided a limited insight into other parts of the world, particularly those where English is not the native language, as well as in places where the organisation and delivery of healthcare takes place in systems that are distinct from those in North America and/or Europe. Conversely, the inclusion of research studies and other types of publications broadened the depth and breadth of this review. There was no critical appraisal or quality assessment of the included research studies, which is in keeping with JBI scoping review methodology[39,40], and was apt; the focus was on mapping the literature on this topic. Drawing upon our diverse range of skills as patient and public interest representative (BA), a Librarian/Information Technologist (AC), and three HP academics (CJ, PG, RS), we reached a consensus on how best to convey the results to others in plain English, a series of recommendations for implementation in practice, as well as the priorities for future research.

Implications for Practice and Policy

A key message arising from this scoping review for health services, professional bodies, and policy makers is that HP's have SES related implicit biases that influence how they organise and deliver patient care. HP decision-making is also subject to non-medical factors, as assumptions are often made about the care of people of low SES based on bias and stereotyping, which causes, or exacerbates health inequalities that can adversely affect patient's clinical outcomes[64]. It is important that we remain mindful that some people do not receive equitable care, so there is a responsibility for all HPs to do what they can to be better informed about their own practice in relation to equity, and to do what they can to address this issue. Heffernan[116] contends that people can find it unpalatable when they are confronted with evidence that challenges their firmly held big ideas, such as HPs who believe that they do no harm and always seek to do good, being informed that their implicit SES related biases may have deleterious impact on the quality, safety, and equity, of patient care. It is always tempting for people to elide inconvenient truths or unpalatable facts because if they are accepted, then the individual is compelled to deal with things in a different way or to address gaps in their knowledge, attitude, skills, and behaviour, which is nearly always challenging. Turning a

blind eye to biases can feel safe for an individual HP, but it is morally untenable as it contravenes the values that underpin healthcare and increasing the likelihood of people who are vulnerable, marginalised, silenced, and/or overlooked by wider society enduring unwarranted variations in care, receiving suboptimal care that is delivered in an iniquitous and unjust manner.

It is challenging for anyone to be truly objective and self-critical about their clinical practice, especially with regards to implicit bias which is tacit and often reflects normalised patterns of thinking and behaviour. In other words, everyone has a rationale or vocabulary of motive, for what they do or do not do, which means that it is challenging for anyone to accept that they have implicit biases, which are often contrary to the way a person thinks about themselves and their behaviour towards others. On the other hand, genuine changes in behaviour and improvement in any human endeavour can only arise when there is a genuine acceptance of truth of the situation, specifically facts and issues at hand, including any implicit biases, with a concomitant theory of action[119]. As challenging as this may be, it is important to bear in mind that a transformation programme of action, especially in terms of improvement, requires a willingness to confront and examine all possible truths by asking searching questions, in this case about the organisation and delivery of healthcare. This sentiment is summed up in the view that not 'knowing something' is understandable because we are human, provided that the person is not turning a blind eye because they 'don't want to know'[116].

Health inequalities only endure because of a lack of insight or willingness to address social injustice, social indifference, an ideological stance of a vacuum of leadership[115]. Given what this scoping review has surfaced about the potential impact of implicit SES related HP bias greater consideration is needed about how the results can inform efforts to reduce health inequalities. It is also important to concede that HPs implicit biases often mirror those of wider society at any given point in time, because their values, beliefs, attitude, outlook, and world view will be tempered and influenced by the communities that they belong to and the wider culture that they inhabit. However, HPs are held to a higher moral standard than other members of society because of who they are and what they do, which comes with the requirement and expectation for them to treat all that they come across in an equitable, just manner with dignity and respect. Social status is linked to power, so for people of low SES, there is often a power differential between HP's and themselves[3]. Bias is dynamic; therefore, the HP-patient interaction can reinforce perceptions and judgemental attitudes that further embed prejudice or stereotypes. Our results suggest that healthcare commissioners, educators and regulators should embed measures to mitigate HPs implicit SES related bias through policy, guidelines, or best practice statements. Healthcare commissioners, policy makers, educators, and regulatory bodies would also do well to ensure that everyone involved on the organisation and delivery of healthcare, especially HPs know that implicit SES related bias increases the risk of the most vulnerable people in society. Simply put, implicit SES related bias by HPs tends to result in people who are the most vulnerable receiving the worst care, which has a harmful impact on their wellbeing, health related outcomes and life expectancy. Given the reality of praxis in healthcare within complex adaptive systems, normalising the practice of HPs taking a brief intermission, when it is clinical safe and appropriate, to be self-aware and to seek a broader perspective, especially when they are under pressure or have a high cognitive load may help to overcome the impact of implicit bias on decision-making. Whatever view one adopts in relation to the issues raised by the results of this scoping review, more research is needed to ensure that healthcare policy and practice are evidence-based in relation to HPs implicit SES related bias.

Conclusion

This scoping review explored different aspects of SES related implicit bias and HP decision-making. Research in this area has grown and evolved significantly and the disciplinary focus has recently shifted from doctors to the wider healthcare team. While there remains limited understanding about the circumstances in which implicit bias is most likely to appear, some evidence suggests that this might be related to the HP's cognitive load, as time pressures can diminish self-awareness.

This review indicates that HPs often hold implicit bias of people with low SES, which can result in stereotyping and may compound or exacerbate health inequalities. It is therefore important to consider mechanisms to reduce the impact of this bias on HP decision-making. Greater awareness of the nature and potential impact of HPs implicit SES related bias and on patient care is urgently needed, as the bias associated with SES can make vulnerable people more vulnerable and may adversely affect clinical outcomes.

Research that focuses on HP decision-making, the influence of non-medical factors, and the impact of limited time/high cognitive load, would therefore help the health community to develop evidence based interventions to mitigate HP bias. Real world solutions, which go beyond education, to identify appropriate approaches to HP decision making, are needed, to ensure decisions are equitable.

Our review highlights the need for relevant research to underpin related healthcare policy and practice. Based on the review, we have identified three pertinent research questions that should be prioritised in future work in this area:

1. Does cognitive load reduce self-awareness of SES implicit bias and impact on the decision-making of the HP?
2. What are the best conditions to support shared decision-making with people who have low SES?
3. What training do HPs need to raise their self-awareness of implicit SES related bias and reduce its impact on their decision-making?

Figure legend Caption

Figure 1: Key terms and their operational definitions in this scoping review

Figure 2: Prisma Flow Diagram

Author Contributions

CJ, RS, PG, AC and BA discussed and refined ideas regarding the search strategy. AC developed the search strategy and conduced the database searches. CJ and RS extracted data and drafted the results . CJ is lead author and guarantor. CJ, RS and PG discussed and drafted the discussion of the paper with contribution from AC and BA.

Conflict of Interest Statement

None of the people listed below declare any conflict of interest which may arise from being named as an author on this manuscript.

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Data Sharing Statement

No additional data available.

Ethics Approval Statement

Ethical approval was not sought for this scoping review because it was a desk top review of previously published work.

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Figure legend Caption

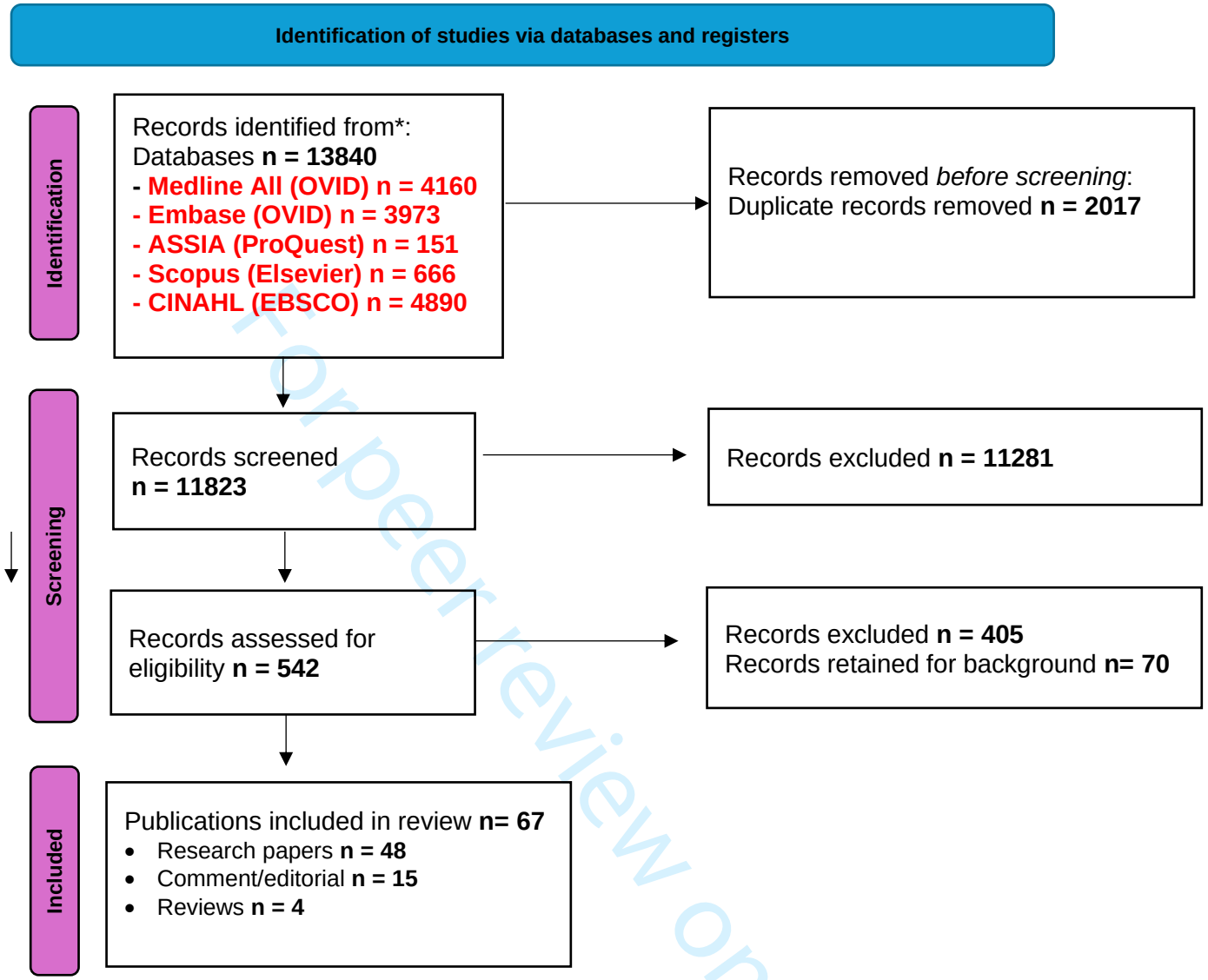
Figure 1: Key terms and their operational definitions in this scoping review

Figure 2: Prisma Flow Diagram

Figure 1: Key terms and their operational definitions in this scoping review

Key term	Operational Definition
Health Professional (HP)	Any registered healthcare professional including Doctors, Surgeons, Nurses, Midwives, or Allied Healthcare Professionals.
Clinical Decision-making	A judgement or decision that influences any aspects of care organised or delivered by the HP such as choices made about the diagnostic tests, and referrals seeking specialist input. It also includes decisions about specific treatments such as surgical procedures, therapies, or medications, as well as ceasing or withdrawing active treatment.
Socio Economic Status (SES)	Any single discrete measure of SES as set out in the Multiple Indices of Deprivation or the Multidimensions of Deprivation, including factors such as income, education, physical environment or neighbourhood quality, and health[14,15]. Any discrete measures that can be used as a proxy for the SES of a patient in HP decision-making such as income, unemployment, education.

Figure 2: Prisma Flow Diagram



Supplementary Material – Search Strategies

Medline ALL (OVIDSP): 1946 to present

1. Socioeconomic Factors/
2. employment/
3. unemployment/
4. Economic Status/
5. Educational Status/
6. Medical Indigency/
7. exp Social Class/
8. exp Health Status Disparities/
9. exp Healthcare Disparities/
10. exp Poverty/
11. exp poverty areas/
12. ((social or socio economic or socioeconomic or economic or income) adj4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*)).tw.
13. ((education* or employment) adj2 (status or level)).tw.
14. (sociodemographic or socio demographic or income or wealth or poverty or affluen*).tw.
15. SES.tw.
16. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 12 or 13 or 14 or 15
17. exp Clinical Decision-Making/
18. exp Decision Making/
19. Patient Care Management/
20. exp disease management/
21. ((Clinical or medical or health or treatment*) adj2 (decision* or decid* or option* or choice*)).tw.
22. (treatment* adj2 (select* or recommend* or receipt)).tw.
23. 17 or 18 or 19 or 20 or 21 or 22

24. exp Prejudice/

25. exp "Attitude of Health Personnel"/

26. exp Professional-Patient Relations/

27. exp Unconscious, Psychology/

28. "unconscious bias*".tw.

29. ((Implicit or explicit) adj3 (cognition or bias*)).tw.

30. prejudice.tw.

31. stereotyp*.tw.

32. Classism.tw.

33. (treatment* adj2 (unequal or differential)).tw.

34. (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or "General Practitioner*" or GP*) adj3 (attitude or judg* or bias)).tw.

35. exp Health Personnel/

36. exp Students, health occupations/

37. 35 or 36

38. exp Psychology, social/

39. exp Mental Processes/

40. 38 or 39

41. 37 and 40

42. 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 41

43. 16 and 23 and 42

EMBASE (OVIDSP): 1947 to present

1. socioeconomics/

2. economic status/

3. income group/

4. poverty/

5. exp employment status/

6. exp educational status/

7. exp social status/

8. exp health care disparity/

9. exp health disparity/

10. ((social or socio economic or socioeconomic or economic or income) adj4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*)).tw.

11. ((education* or employment) adj2 (status or level)).tw.

12. (sociodemographic or socio demographic or income or wealth or poverty or affluen*).tw.

13. SES.tw.

14. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13

15. exp clinical decision making/

16. exp medical decision making/

17. exp decision making/

18. patient care/

19. disease management/

20. ((Clinical or medical or health or treatment*) adj2 (decision* or decid* or option* or choice*)).tw.

21. (treatment* adj2 (select* or recommend* or receipt)).tw.

22. 15 or 16 or 17 or 18 or 19 or 20 or 21

23. exp prejudice/

24. exp cognitive bias/

25. exp health personnel attitude/

26. exp professional-patient relationship/

27. exp ego development/

28. exp stereotypy/

29. prejudice.tw.

30. stereotyp*.tw.

31. Classism.tw.

32. (treatment* adj2 (unequal or differential)).tw.

33. (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or "general practitioner*" or GP*) adj2 (attitude or judg* or bias)).tw.

34. exp health care personnel/

35. exp health student/

36. 34 or 35

37. exp social psychology/

38. cognition/

39. mental function/

40. 37 or 38 or 39

41. 36 and 40

42. 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 41

43. 14 and 22 and 42

44 limit 43 to english language

ASSIA (Proquest): 1987 to present

((MAINSUBJECT.EXACT.EXPLODE("Socioeconomic factors") OR MAINSUBJECT.EXACT.EXPLODE("Socioeconomic indicators") OR MAINSUBJECT.EXACT.EXPLODE("Socioeconomic conditions") OR MAINSUBJECT.EXACT("Employment") OR MAINSUBJECT.EXACT("Unemployment") OR MAINSUBJECT.EXACT("Poverty") OR MAINSUBJECT.EXACT.EXPLODE("Low income people") OR ab((social NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((socio economic NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((socioeconomic NEAR/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR

determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ab((sociodemographic OR socio demographic OR income OR wealth OR poverty OR affluen*))) AND (MAINSUBJECT.EXACT.EXPLODE("Decision making") OR ab(((Clinical OR medical OR health OR treatment*) NEAR/2 (decision* OR decid* OR option* OR choice*))) OR ab((treatment* NEAR/2 (select* OR recommend* OR receipt))))) AND (MAINSUBJECT.EXACT("Bias") OR MAINSUBJECT.EXACT.EXPLODE("Cognitive bias") OR MAINSUBJECT.EXACT.EXPLODE("Prejudice") OR MAINSUBJECT.EXACT.EXPLODE("Health professional-Patient relationships") OR ab(((Implicit OR explicit) NEAR/3 (cognition OR bias*))) OR ab("unconscious bias*") OR ab(Classism) OR ab((treatment* NEAR/2 (unequal OR differential))) OR ab(Stereotyp*) OR ab((("Health professional*" OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR SHO* OR surgeon* OR student* OR AHP* OR allied OR physio* OR speech OR occupational OR Dietitian* OR therapist* OR radiographer* OR midwi* OR "general practitioner*" OR GP*) NEAR/2 (attitude OR judg* OR bias*)))) OR ab(prejudice*))

Scopus (Elsevier): 1960 to present

((TITLE-ABS-KEY (social W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR (TITLE-ABS-KEY ("socio economic" W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR (TITLE-ABS-KEY (socioeconomic W/4 (deprivat* OR advantage* OR disadvantage* OR disparit* OR status OR class OR position OR hierach* OR determinant* OR inequalit* OR inequit* OR barrier* OR circumstance*))) OR ((TITLE-ABS-KEY (sociodemographic)) AND (TITLE-ABS-KEY (income OR wealth OR poverty OR affluen*))) OR (TITLE-ABS-KEY (employment OR unemployment))) AND ((TITLE-ABS-KEY (clinical W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (medical W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (health W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY (treatment W/2 (decision* OR decid* OR option* OR choice*))) OR (TITLE-ABS-KEY ((treatment OR clinical) W/2 recommend*))) AND ((TITLE-ABS-KEY ("health professional" -patient W/1 relations)) OR (TITLE-ABS-KEY (doctor-patient W/1 relations)) OR (TITLE-ABS-KEY (clinician-patient W/1 relations)) OR (TITLE-ABS-KEY (nurse-patient W/1 relations)) OR (TITLE-ABS-KEY ("unconscious bias*")) OR (TITLE-ABS-KEY ((implicit OR explicit) W/3 bias*)) OR (TITLE-ABS-KEY ((implicit OR explicit) W/3 cognition)) OR (TITLE-ABS-KEY (classism)) OR (TITLE-ABS-KEY (prejudice*)) OR (TITLE-ABS-KEY (("Health professional" * OR nurse* OR doctor* OR clinician* OR physician* OR

registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi*) W/2 attitude*)) OR (TITLE-ABS-KEY (("Health professional" * OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi*) W/2 bias*)) OR (TITLE-ABS-KEY (treatment* W/2 (unequal OR differential))) OR (TITLE-ABS-KEY (("Health professional*" * OR nurse* OR doctor* OR clinician* OR physician* OR registrar* OR intern* OR sho* OR surgeon* OR student* OR ahp* OR allied OR physio* OR speech OR occupational OR dietitian* OR therapist* OR radiographer* OR midwi* OR “general practitioner*” OR GP*) W/2 judg*)))

CINAHL (EBSCO): 1976 to present

S52 S16 AND S24 AND S50 Narrow by Language: - english

S51 S16 AND S24 AND S50

S50 S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S49

S49 S45 AND S48

S48 S46 OR S47

S47 (MH "Mental Processes+")

S46 (MH "Psychology, Social+")

S45 S43 OR S44

S44 (MH "Students, Health Occupations+")

S43 (MH "Health Personnel+")

S42 AB (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi*) N2 (attitude or judg* or bias*))

S41 TI (("Health professional*" or nurse* or doctor* or clinician* or physician* or registrar* or intern* or SHO* or surgeon* or student* or AHP* or allied or physio* or speech or occupational or Dietitian* or therapist* or radiographer* or midwi* or “general practitioner*” or GP*) N2 (attitude or judg* or bias*))

S40 AB (treatment* N2 (unequal or differential))

S39 TI (treatment* N2 (unequal or differential))

S38 AB Classism

S37 TI Classism

S36 AB stereotyp*

S35 TI stereotyp*

S34 AB prejudice

S33 TI prejudice

S32 AB ((Implicit or explicit) N3 (cognition or bias*))

S31 TI ((Implicit or explicit) N3 (cognition or bias*))

S30 AB "unconscious bias*"

S29 TI "unconscious bias*"

S28 (MH "Unconscious (Psychology)")

S27 (MH "Professional-Patient Relations+")

S26 (MH "Attitude of Health Personnel+")

S25 (MH "Prejudice+")

S24 S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23

S23 AB (treatment* N2 (select* or recommend* or receipt))

S22 TI (treatment* N2 (select* or recommend* or receipt))

S21 AB ((Clinical or medical or health or treatment*) N2 (decision* or decid* or option* or choice*))

S20 TI ((Clinical or medical or health or treatment*) N2 (decision* or decid* or option* or choice*))

S19 (MH "Disease Management")

S18 (MH "Decision Making+")

S17 (MH "Decision Making, Clinical+")

S16 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15

S15 AB SES

S14 TI SES

S13 AB (sociodemographic or socio demographic or income or wealth or poverty or affluen*)

S12 TI (sociodemographic or socio demographic or income or wealth or poverty or affluen*)

S11 AB ((social or socio economic or socioeconomic or economic or income) N4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*))

S10 TI ((social or socio economic or socioeconomic or economic or income) N4 (deprivat* or advantage* or disadvantage* or disparit* or status or class or position or hierach* or determinant* or inequalit* or inequit* or barrier* or circumstance*))

S9 (MH "Economic Status")

S8 (MH "Poverty Areas")

S7 (MH "Poverty+")

S6 (MH "Healthcare Disparities")

S5 (MH "Health Status Disparities")

S4 (MH "Social Class+")

S3 (MH "Unemployment")

S2 (MH "Employment+")

S1 (MH "Socioeconomic Factors+")

Supplementary Material 2. Scoping Review Data Extraction Tool

Adapted from the JBI Scoping Review Data Extraction tool[20]

Scoping Review Details	
Scoping Review title:	Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review
Review objective/s:	To scope the reported impact of HP bias about SES on clinical decision making and its effect on the care for people with lower SES in wider literature
Review question/s:	• RQ1: What has been published about implicit SES bias and HP attitudes or behaviours when deciding/providing care. • RQ2: How does SES effect the dynamics of the HP and patient relationship? • RQ3: What recommendations for practice have been postulated, implemented, or evaluated to address HP implicit bias related to SES.
Inclusion/Exclusion Criteria	
Population: Adults	
Concept: SES	
Context: HP decision making	
Types of publication or evidence source	
Evidence source Details and Characteristics	
Citation details (e.g., author/s, date, title, journal, volume, issue, pages)	
Country	
Context – professional group	
Disease group (if applicable)	
Participants (details e.g., age/sex and number)	
SES Terminology used.	
Details/Results extracted from source of evidence	
SES effect on HP and patient relationship	

Implicit biases, attitudes or behaviours that connect SES and decision making	
Healthcare professionals' decision making, and the impact of the decisions made **Types of Healthcare professionals, care context and/or setting**	
Recommendations for practice to mitigate bias	
Identify how SES was measured in the included papers.	

Table 3 Paper Characteristics

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
1	Crane (1975) USA	**Research Paper** Vignette case studies and Questionnaire	To assess the appropriateness of social as compared to physiological criteria in deciding to treat critically ill patient.	**Doctors** Internal Medicine and Neurosurgery	Case studies based on occupation and employment. A Banker and an unemployed Labourer.	**Yes**	Doctors did differentiate between a patient with a high and low status occupation when making decisions about the aggressiveness of treatment offered. However, when asked to rank the relative influence of social characteristics upon their decisions to treat chronically ill patients, they ranked social criteria as having a low influence on their decision-making.
2	Eisenberg (1979) USA	**Editorial/Comment** NA	Sociologic Influences on Decision-Making by Clinicians	**Doctors** Specialism not specified.	This paper reviews the contributions to our understanding of sociologic influences on clinical decision-making.	**NA**	The bulk of the available literature implies a significant relation between social class and decisions regarding patient management. Further investigation is needed- various methods of sociologic research could be used to provide the data for these studies e.g., participant observation, record review, questionnaires, interviews, case studies, or direct recording of the interaction.
3	MacCormick et al (1990) Canada	**Research Paper** Vignette – Four clinical scenarios	To assess decision-making in cancer treatments using age and SES as independent variables.	Medical Students	Occupation and employment were used as a proxy for SES. In this study SES was assessed with age. and it is difficult to separate these in the results.	**Yes**	Personal bias of the physician plays a role in decision-making about treatment for cancer in these vignettes. It is difficult to separate age and SES these in the results. Statistically significant differences $p<0.001$ in decisions to treat younger professional than older persons. Statistically significant differences $p<0.001$ in decisions to treat a young mother than a young female "mentally handicapped" person.
4	Brown (1993) USA	**Research Paper** Interviews and focus groups. seventy-two health, social work, administrative research, and advocacy HPs	Exploration of class and confidentiality for mothers with HIV.	Multi-professional Obstetrics:	Income	**Yes**	Lower social class people not viewed as holding their confidentiality as a personal priority - it matters less to them. Mums with greater authority due to income, political or social standings can expect greater confidentiality compared to mothers who are less economically fortunate.
5	McKinlay et al (1996) USA	**Research Paper** Vignette video scenarios 1. Chest pain 2. Dyspnoea	To assess non-medical influences on decision-making.	**Doctors** coronary heart disease.	socioeconomic status, and health insurance coverage.	**Yes**	A link found between insurance coverage on cardiac diagnosis for chest pain, particularly in the older patients. Intersectionality with Age. Among the older patients, those with insurance were significantly more likely to receive the primary cardiac diagnosis than those without insurance, whereas among younger patients' insurance had no effect.
6	McKinlay et al. (1997) USA	**Research Paper** Vignette cancer video scenarios involving a breast mass	To assess non-medical influences on decision-making	**Doctors** Breast Cancer	Patient characteristics were varied in the videotapes to indicate socioeconomic	**Yes**	Women of lower SES were more likely to receive less aggressive care ($p<0.07$). physicians recommended either chemotherapy or tamoxifen to 73% of higher SES women, compared with 53% of lower SES women.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
					status: dress, grammatical style, and insurance status		Insurance and ability to pay also were associated with disparity in physician recommendations.
7	Feldman et al 1997 Ml... USA	**Research Paper** An Experimental Technique Using Videotapes, Factorial Design, and Survey Sampling.	To assess non-medical influences on decision-making.	**Doctors** Secondary care	Challenging to ascertain how SES was measured or described	**No**	The data suggest that the physician subjects gave clinically valid answers to the questions and that the variations in clinical decision-making identified by the factorial experiment can be interpreted as generalizable differences.
8	Wolder-Leven et al 1998 USA	**Editorial/Comment** Social Class and Medical Decision-making	People of different classes may receive differential treatment from providers for the same health conditions due to discrimination based on class.	**Doctors** Specialism not specified.	Paper discusses SES measures - as indicators of class. The word class works as a shorthand to refer to a person's social location, a "lived reality," in which life chances, values, health and well-being, morbidity and mortality, and concepts of self, other, and collectively are shaped by the relationship of the individual to the social organization of production. Should stop trying to define class in terms of a set of socioeconomic indicators such as income level.	**NA**	it is important to recognize that giving people the same choices about medical treatments does not necessarily mean that they are being treated equally, because patients do not lead equal lives. At the point of medical decision-making it becomes clear that class-based differences can even lead to difference between life and death.
9	Parens 1998 USA	**Editorial/Comment** Social Class and Medical Decision-making.	Bioethicists often discuss issues of social class in relation to access to health services - bioethics literature reveals that class is rarely a focus in the analysis of medical decision-making.	**Doctors** Specialism not specified.	Considering a person's SES might lead to not offering treatment to a person who does not have the resources and only offering it to people with those resources. An understanding of class and its relationship to medical decision-making should be used to provide equity and not to explain away unwarranted variations in care.	**NA**	Health care providers need to listen to patients in unaccustomed ways, the next and much bigger step will be to think systematically about how to promote such listening particularly with time constraints on health professionals.

	Author(s) date Country	Type of Publication Research design/method (If applicable)	Aim(s) (If stated)	Population Professional Specialty	Concept SES Measure	Context Link HP Bias& Decision-making	Key results, findings, or information
10	Krupat et al 1999 USA	**Research Paper** Vignette – Video	To determine whether assertive patient behaviour influences physician decision-making in the treatment of older breast cancer patients.	**Doctors** Cancer	Socioeconomic status [as well as age, race, mobility, general health, and assertive behaviour] of the patients were varied.	**Yes**	Assertive behaviour on behalf of a women with lower SES helps them to get testing e.g., auxiliary node biopsy. Assertiveness led to more careful diagnostic testing for patients who came from groups that are "disadvantaged."
11	Gordon et al 2000 USA	**Research Paper** Cross-sectional study design, interviews using semi-structured questionnaire of physicians and patents.	An assessment of Patient-Nephrologist discussions about kidney transplantation as a treatment option	**Doctors** Haemodialysis and Nephrologists	SES determined by education level, occupational level, and socioeconomic status level. All low to high rated.	**Yes**	Bias is not overtly discussed however finding show fewer medical explanations and less time spent with patients of Low SES. Patient age and socioeconomic status influence discussions of transplantation as a treatment option. low socioeconomic status patients were less likely to report being encouraged even after adjustment for transplant suitability.
12	Van-Ryn et al 2000 USA	**Research Paper** Survey data examined	The degree to which patient race and socio-economic status effects physicians' perceptions of patients	**Doctors** post-angiogram care.	A three-category measure of SES was developed. The SES index was created by standardizing patient income and education and averaging the two together.	**Yes**	Intersectionality with race is difficult to unpick. Low SES patients viewed as less likely to be pleasant and rationale. physicians gave lower SES patients more negative ratings on personality characteristics (lack of self-control, irrationality) and level of intelligence.
13	McKinlay et al 2002 USA	**Research Paper** Vignette video study 1. Polymyalgia 2. Depression	To assess the influence of non-medical factors on decision-making.	**Doctors** Internalist and primary care	SES depicted by appearance and employment in the video vignettes	**No**	SES of the patient does not show any impact on decision-making.
14	Tamayo-Sarver (2003) USA	**Research Paper** Vignette 1. Ankle Fracture 2. Migraine Non-traumatic back pain.	To measure the Effect of Race/Ethnicity and Desirable Social Characteristics on Physicians Decisions to Prescribe Opioid Analgesics	**Doctors** Emergency Department	Occupation and/or relationship with a primary care provider.	**Yes**	Race did not impact on prescribing differences. SES and information about patient social desirability (e.g., occupation) increased the rates of prescribing for the migraine and back pain patient vignette, but this did not alter the rate for ankle fracture. There were statistically discernible increases in the rate of prescribing, 4% ($p<0.04$) for migraine and 6% ($p<0.01$) for back pain. The information on socially desirable characteristics may have affected physicians' perceived likelihood that the patient is feigning illness and surreptitiously seeking opioids.

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15	Henley et al 2004 USA	**Editorial/Comment** 10 steps for avoiding health disparities in your practice	Discussion about disparities and health inequalities.	**Doctors** Specialism not specified.	Discusses intersectionality. The evidence regarding differences in the care of patients based on race, ethnicity, gender, and socioeconomic status suggests that if this patient is a woman or African American or from a lower socioeconomic class, resultant morbidity or mortality will be higher.	**NA**	Recommends that minimising the effect of bias and stereotyping could be achieved for all patients by using evidence-based practice guidelines.
16	Manderbacka 2005 Finland	**Research Paper** Exploratory qualitative study	Trace key points in the treatment where patients gender & SES experience differences	**Doctors** Coronary heart disease.	Blue-collar and white-collar occupations	**Yes**	There was a doctor-centred model common among blue-collar workers and an increased patient centred model with shared decision-making common among those using private care 'white collar occupations. The utilization of private care is clearly concentrated in higher socioeconomic groups in Finland.
17	Arber et al 2006 UK	**Research Paper** A video-simulation experiment. Conducted simultaneously in both USA and UK	Patient characteristics and inequalities in doctors' diagnostic and management strategies relating to CHD.	**Doctors** Coronary heart disease	SES indicated by occupation and dress - middle class (schoolteacher) or working class (cleaner in UK; janitor in US). Class was also expressed by style of dress and appearance.	**No**	Class was not significantly associated with any aspect of doctors' information gathering or decision-making.
18	Barnhart et al 2006 USA	**Research Paper** Questionnaires developed from focus groups.	Can Non-medical Factors Contribute to Disparities in Coronary Heart disease treatments.	**Doctors** coronary heart disease	socioeconomic status discussed in terms of finance barriers - social support (ability/insurance to pay for a revascularization procedure) as judged by the physician.	**Yes**	People with low SES were not trusted by the physician. Patients most knowledgeable (and assertive) about the procedure, and those with resources, who were most likely to adopt a healthy lifestyle (as perceived by the physician) are most likely to receive recommendations for revascularisation.
19	Denburg et al 2006 USA	**Research Paper** Randomised, 2X2 factorial design clinical vignette.	The Influence of Patient Race and Social Vulnerability on Urologist Treatment Recommendations in Localized Prostate Carcinoma.	**Doctors** Cancer	Middle income (and married) Low Income (and widowed) therefore the variables were not distinct.	**Yes**	Watchful waiting offered more frequently for socially vulnerable patients (low income and widowed) - both white and black patients. Intersectionality means that low income/widowed black patients received the lowest referral for radical prostatectomy. Low income/widowed white men also received lower referral for prostatectomy.

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20	Bernheim et al 2008 USA	**Research Paper** A Qualitative Study semi structured interviews	Influence of Patients' Socioeconomic Status on Clinical Management Decisions.	**Doctors** Primary care	As described by the participants: Economic Uninsured - Unemployed- On welfare- Sociocultural- Low educational achievement- Poor social networks.	**Yes**	All physicians recounted circumstances in which the patient's SES did affect their clinical management decisions. Even physicians who initially asserted that all patients in their practice received identical care later described differences based on patient SES.
21	Eggly et al 2008 USA	**Research Paper** Video recorded outpatient interactions during which oncologists invited patients to participate in clinical trials.	Oncologists' recommendations of clinical trial participation to patients	**Doctors** cancer	SES determined by education: high school or less technical or trade school college or greater.	**No**	Data showed that people with higher education (0.07) received more recommendations than men and those with lower education. This was not statistically significant.
22	Ling Fan et al 2008 USA	**Review** A search of the Internet identified thousands of Web sites, documents, reports, and educational materials pertaining to health and pain disparities.	Awareness and Action for Eliminating Health Care Disparities in Pain Care: Web-Based	**Multi-professional** Palliative care.	Paper discusses SES	**NA**	Studies have explored the factors influencing the often-unintentional pervasive nature of biases and stereotyping that affect treatment decisions for managing pain. Discriminatory practices that are deep seated in biases, stereotypes, and uncertainties around communication and decision-making processes contributing to inequities in care.
23	Franks et al 2008 USA	**Editorial/Comment** This paper examines a hierarchy of three domains for interventions to address health inequalities downstream. 1. health system 2. provider–patient interactions 3. clinical decision-making	Upstream or fundamental causes (such as poverty, limited education, and compromised healthcare access) is essential to reduce healthcare disparities. But such approaches are not sufficient, and downstream interventions, addressing the consequences of those fundamental causes.	**Doctors** Specialism not specified.	Paper discusses SES	**NA**	Physician biases likely to contribute to disparities. Greater social and cultural distance between providers and patients increases the potential for suboptimal encounters. Patients at greater social risk for adverse health outcomes have encounters characterized by less patient participation and providers viewing those encounters more negatively.

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24	Nampiaparampil et al 2009 USA	**Research Paper** Vignette - double-blinded randomized controlled study.1. patient with chronic low back. 2. lower extremity pain	To assess the contribution of non-medical decision-making to the assessment and management of pain.	**Doctors** rehabilitation community hospitals	Medical insurance Blue Cross Vs Medicaid	**Yes**	Unable to unpick race and insurance status in these vignette examples. Patient ethnicity/SES differences in the prescription of morphine (p = 0.053). Patient ethnicity/SES significantly affected the rate of referral for a nerve block (P = 0.04).
25	Wilson 2009 UK	**Research Paper** Vignette – case scenarios. One of two patient scenarios was employed in a self-administered questionnaire	Scenarios and Questionnaires addressed pain knowledge, inferences of physical pain, general attitudes, and beliefs about pain management. The participants were required to identify the patient's pain level and make pain management decisions.	**Nurses** pain	The variable lifestyle/socio-economic status (SES) of the patient was manipulated; all other patient variables were kept constant. High SES - businessperson Low SES - unemployed construction worker	**Yes**	There was a difference in pain management between high and low SES patients - both general and CNS nurses showed inferences of patient pain and management decisions which are based on myths about Low SES addiction. There was an observed trend to be more likely to under medicate low SES over high SES patients.
26	Ceballo et al 2010 USA	**Research Paper** A three-page survey was mailed to physicians in one state. Case scenario of a young women trying to get pregnant. The patient's race and social class varied across the surveys.	Surveyed about their knowledge of infertility among different demographic groups of women and examines how patient and physician characteristics may influence physicians' treatment responses to hypothetical infertile patients.	**Doctors** Family planning	Different educational groups were used to reflect social class differences among women.	**No**	Referral practices did vary related to insurance status of the patient. Physicians' reluctance to refer Medicaid patients to infertility specialists is explained as understandable given the great expense of specialized infertility services and the lack of Medicaid insurance coverage for such services.

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27	Gilbert et al 2010 Canada	**Research Paper** A retrospective cohort study of women with a previous Caesarean section.	Does Education Level Influence the Decision to Undergo Elective Repeat Caesarean Section Among Women with a Previous Caesarean Section.	**Doctors** Obstetrics	Education level was stratified.	**Yes**	Higher education is associated with an increased rate of elective repeat Caesarean section ($p<0.047$ and $p<0.03$). Whether this is due to patient differences or physician bias, physicians should be aware of this disparity and should attempt to provide unbiased informed consent for all women
28	Hajjaj et al 2010 UK	**Research Paper** Semi-structured qualitative interviews were conducted with clinicians working in departments of dermatology	Assessment of nonclinical influences, beyond diagnosis and severity, on clinical decision-making in dermatology.	**Doctors** Dermatology	Education level and financial status and treatment related costs	**Yes**	This paper does not offer a strong link between SES and decision-making. Sixty five percent of clinicians said that treatment-related costs that patients are likely to incur would sometimes influence their decision-making inability to afford transportation costs or cost of child minding at home. 19.6% clinicians raised education/intelligence as an issue especially relating to cases where systemic treatments with potential side-effects are required. Where there is a lack of awareness or understanding of the range of influences, there is a risk that some influences may *subconsciously* adversely impact on optimal decision.
29	Kristine Bærøe and Berit Bringeda 2011 Norway	**Editorial/Comment** A discussion about the conditions for acceptable and unacceptable priority settings with respect to patients' socioeconomic status.	The pattern is equal in all countries, the higher the socioeconomic status (SES) of patients, the better the health and the higher the life expectancy; health prospects are distributed along a social gradient.	**Doctors** Specialism not specified.	Paper discussed SES	**NA**	Health inequity in healthcare services by inaccurate interpretations of 'healthcare need' and biased care due to unconscious influence by patients' SES. Prioritisation of health need according to SES as a basis of equity is not ethical. Socioeconomic Factors and their impact on health should be forefront of HP thinking - raising awareness in order to prevent reinforcement of health inequity.
30	Detsky 2010 USA	**Editorial/Comment** HP provide services and make decisions about diagnostics, treatments, procedures etc. There are variations.	The paper discusses... ... GPs and surgeons are biased against women, people from low SES groups, and other minority groups?	**Doctors** Specialism not specified.	Paper discussed SES	**NA**	Unintentional bias, which is far more common than intentional corruption, is particularly worrisome because humans are facile with rationalizing and often are not even aware of their bias. It is difficult to overcome bias that one does not even know is there.

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31	Paul Dieppe 2011 UK	**Editorial/Comment** A discussion about the inequalities in the provision of surgical Interventions for people with Rheumatology conditions.	In the context of state provided healthcare - many studies have shown that older people, women, ethnic minorities, and those of lower SES are all likely to receive variations in inventions compared to well-off, middle aged white males.	**Doctors** Rheumatology	Paper discussed SES	**NA**	The paper finds significant effects of SES on both hip and knee joint replacement rates for people with Osteoarthritis. It suggests that GPs and surgeons are biased against women, low SES patients, and other minority groups.
32	Dougal et al 2010 USA	**Research Paper** Online national survey	the influence of SES was examined on psychotherapists cognitive attributions and counter-transferences.	**Psychological therapists** Mental Health	Paper discusses SES	**Yes**	SES impacts on counter-transference reactions and clinical judgments according to SES. Rated interpersonal behaviour of the client with higher SES has evoking feelings of dominance more so than the lower SES. CAS measurement of 'causal attribution' found no statistically significant differences related to clinical judgment
33	Haider et al 2010 USA	**Research Paper** Clinical vignettes. The survey included the Implicit Association Test (IAT) to assess unconscious preferences	To estimate unconscious race and social class bias among first-year medical students and investigate its relationship with assessment.	**Medical students**	Social class was depicted using occupation. Patient vocation is commonly used as a proxy for social class. Patient occupations were chosen using the NamPowers occupational prestige scale, which ranks occupations on a scale from 1 to 100.	**No**	IAT testing showed A preference toward those in the upper class among 174 students (86%). a lower-class preference in 6 (3%). Multivariable analyses for all vignettes found no significant relationship between implicit biases and clinical assessment. Analysis stratified by patient race or class did not demonstrate any statistically significant association between student IAT scores and how students assessed patients for any of the vignettes. No interaction between IAT D scores and vignette patient class (or race) was found for any of the vignettes.
34	McKinlay et al 2012 USA	**Research Paper** A factorial experiment using video vignettes was conducted. 1. Patient symptoms of diabetes 2. Known diabetes with emerging peripheral neuropathy.	To investigate additional causes of health care disparities in the decision-making of primary care doctors.	**Doctors** Primary care	Appearance altered to reflect Class. Men presented with collar and tie (upper SES) or plaid shirt and jacket (lower SES). Women presented with either blazer with broach and makeup (high SES) or sweatshirt and no makeup (lower SES).	**Yes**	clinical management (specifically for foot neuropathy) is influenced by patient socioeconomic status (SES). Overall, upper SES patients would receive these essential examinations compared with lower SES patients. Upper SES patients were slightly more likely to be asked questions about their medical history ($P < 0.05$ for history of eye disease) and were more frequently referred to ophthalmologist ($P = 0.024$).

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35	Shawahna et al 2012 Pakistan	**Research Paper** Qualitative with two observational phases. Semi-structured interviews - 2 hospitals, 2 diabetes care centres and 2 private clinics. Prescriptions were analysed for socioeconomic indicators. In the second phase, the opinions of a panel of prescribers on the influence socioeconomic indicators on prescribing behaviour were elicited.	To investigate physician's perspectives of patients' SES and the important indicators influencing prescribing behaviour.	**Doctors** Diabetes	participants described SES based on 'job role' and a judgment about whether the person might be able to afford treatment.	**Yes**	Literacy, educational background, compliance, dress, and appearance were important indicators at the time of clinical decision-making for physicians originating from urban areas. Participating physicians agreed that patient's socioeconomic status influenced their drug prescribing behaviour
36	Smith-oka 2012 Mexico	**Research Paper** Interviews and participant observation	To investigate Risk – motherhood in a Mexican public hospital.	**Multi-professional Doctors, Midwives, and Nurses**. Obstetrics	Income and area od residence	**Yes**	Good mothers are married, knowledgeable, follows norms. Bad mothers are unmarried, uneducated, deviant. These views thought to reflect the paternalistic class structure of Mexican society. Explicit bias of low SES single mothers evident in this research - linked again to cooperation. Pressure for sterilisation Vs the use of an IUD in low SES women.

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37	Lay-Yee er al 2013 NZ	**Research Paper** Sample of 9272 encounters at 185 family practices. Each practitioner was asked to provide data on themselves and on their practice, and to report on every fourth of their patients (a 25% sample) in each of two week-long periods separated by an interval of six months. The questionnaire recorded data about the patient, his or her problems and their management.	social disparities in health are pervasive features of health care systems. studying inter-practitioner variation in clinical activity across four payment types in New Zealand primary care system.	**Doctors** Primary Care	deprivation level - NZ multi-index of deprivation used quintiles 1-5	**Yes**	There was greater variability of practitioner decision-making for socially disadvantaged patients found in fee-for service settings. Practitioners may have difficulty processing relevant clinical information for socially disadvantaged patients, and this greater degree of uncertainty may in turn be reflected in more variable decision-making. While there was little evidence in this primary care sample of systematic bias in clinical activity level by patient social group, practitioner variability was much more marked for patients drawn from ethnically and socio-economically disadvantaged background.
38	Haider et al 2014 USA	**Research Paper** Participants completed nine clinical vignettes, each with three trauma/acute care surgery management questions. social class IAT assessments were completed by each participant. Multivariable, ordered logistic regression to test IAT on decision-making.	To assess Unconscious race and class bias and Its association with decision-making by trauma and acute care surgeons	**Doctors** Trauma	Social class stated in Vignette.	**No**	90.7% demonstrated an implicit preference toward upper social class persons. Biases were not statistically significantly associated with clinical decision-making So despite high levels of implicit bias this did not alter the decisions made by the physician in a statistically significant way.

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39	Haider et al 2015 USA	**Research Paper** Prospective Vignette study conducted among surgical RNs. Implicit association tests (IATs) for social class and race. Ordered logistic regression	To assess unconscious Race and Class Biases among Registered Nurses.	**Nurses** Surgery	patients' race or social class were randomly altered. Social class vignettes used patients' occupations as proxies for their social status.	**No**	93.47% demonstrated an implicit preference toward upper social class persons. Participants were more likely to think that a lower SES with anxiety did not understand the procedure and needed to be re-consented. Intersectionality detected between race and SES and the use of post-surgical restraints and sedation. Implicit biases among RNs did not correlate with clinical decision-making. Presence of an unconscious bias was not associated with any overall differences in vignette-based clinical assessment and decision-making.
40	Haider et al 2015 USA	**Research Paper** Clinical vignettes, each with 3 management questions. Ordered logistic regression analysis on the Implicit Association Test (IAT) scores and used multivariable analysis to determine whether implicit bias was associated with the vignette responses.	To assess the relationship between unconscious bias and clinical decision-making	**Doctors** Surgery	The paper does not state how SES was communicated via the vignette style study.	**No**	Although implicit biases of race and social class were present among most of the trauma and acute care clinician respondents, these biases were not associated with clinical decision-making. Clinicians were less likely to order an MRI of the cervical spine for patients with neck tenderness after a motor vehicle crash for low SES patients - this is hypothesised to be linked to health insurance status.
41	John-Henderson 2015 USA	**Editorial/Comment** Implicit bias od SES discussed along with as implicit bias of race, gender, suicidal ideation, and obesity).	Implicit cognition implications for global health	**Doctors** Mental health	paper discusses the use of the MacArthur SES scale - which is a self-rated 'place a cross on the ladder to indicate your position' scale	**NA**	Biases and discussed alongside resilience. The paper recommends an investigation into why some HPs make biased decisions and some do not. This could reduce the overall impact of implicit biases on health, both at the level of the individual and by positively affecting the relationship between patient and physician.
42	Williams et al 2015 USA	**Research Paper** Vignette based study - surveyed seniors at 84 medical schools. two clinically equivalent management options for a set of cardiac patient vignettes. examined variations in student recommendations.	Investigation of variations in medical student recommendations based on patient race, gender, and socioeconomic status.	**Doctors** coronary heart disease	Patient SES was determined solely by the Hollingshead Occupational Scale and was fixed for each individual vignette but varied across the set of eight cardiac vignettes.	**Yes**	Patient SES was a strong and significant predictor of student recommendations. With some intersectionality - when the patient was presented as being in the lowest SES group (SES 1–2), students were more likely to recommend procedures for black patients, and least likely to do so for white female patients. Judgmental attitudes from providers, even if not explicitly expressed, negatively affect physician–patient trust.

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43	Castaneda-Guarderas et al 2016 USA	**Editorial/Comment** A discussion about shared decision-making with vulnerable Populations in the Emergency Department.	This paper considers the future research agenda needed to examine shared decision-making with vulnerable populations of people who present to emergency departments in the U.S.	**Doctors** Specialism not specified.	Discussed in terms of Socioeconomic Disadvantage uneducated unemployed uninsured	**NA**	Shared decision-making in the ED setting among patients with socioeconomic challenges may be inhibited by a perceived power differential between physicians and their patients, beyond that experienced by more affluent patients.
44	Elholm Madsen et al 2016 Denmark	**Research Paper** An experimental factorial vignette survey was used. Four different vignettes describing fictitious patient cases with different SES variables were randomly allocated to therapists working in somatic hospitals.	To investigate whether occupational therapists and physiotherapists are influenced by the patient's SES	**Occupational Therapist** Somatic care	Employment status and educational level were used as a proxy for SES. a white collar-worker (lawyer employed and unemployed) a blue collar-worker (janitor employed or unemployed);	**No**	There were no statistically significant associations between the patient's SES and the judgements related to the patient's rehabilitation OR the rehabilitation effort given in phase one or towards providing equal treatment in a therapeutic situation.
45	Popescu et al 2016 USA	**Research Paper** Retrospective 1995 - 2007 data collected from the SEER programme. Key interests were race and SES.	to understand whether between-physician and within physician variations play a role in cancer care disparities among seniors with breast and colorectal cancer enrolled in a national cancer surveillance program.	**Doctors** Cancer	Measured SES using patients' zip code median household income, categorized into deciles. SEER files contain several zip code and census tract-level SES variables.	**Yes**	Patients residing in high-income zip codes were more likely to receive treatment than patients residing in low-income zip codes (e.g., 69%, 53%, and 65% top decile income patients received BCS, chemotherapy, and radiation vs. 46%, 48%, and 43% bottom decile income patients).

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46	Fitzgerald et al 2017 International	**Systematic Review** PubMed, PsychINFO, PsychARTICLE and CINAHL were searched for peer-reviewed articles published between 1st March 2003 and 31st March 2013. Two reviewers assessed the eligibility of the identified papers based on precise content and quality criteria. The references of eligible papers were examined to identify further eligible studies.	To assess publications examining implicit bias in healthcare professionals.	**Multi-professional** NA	SES	**Yes**	All studies found evidence for SES implicit biases among physicians and nurses. Class may trump race in some circumstances so that being high SES is more salient than being non-white. Based on the available evidence, physicians, and nurses manifest implicit biases to a similar degree as the general population. Biases also exist for age, mental illness, weight, having AIDS, brain injured patients perceived to have contributed to their injury, intravenous drug users and disability.
47	Murphy et al 2017 USA	**Editorial/Comment** A discussion about socially at-risk populations in relation to health disparities.	Increasingly, it is recognized that disparities are driven not by differences in biology or individual patient characteristics, but rather by social determinants, or the conditions of the environments in which people live.	**Doctor** Specialism not specified.	Paper discusses socioeconomic position	**NA**	Bias manifests itself in behaviours that impede relationship building. Physicians with higher levels of general bias are more likely to talk slowly, have greater verbal dominance, and have less patient-centred dialogue. Implicit bias influences diagnosis, treatment recommendations, questions asked of the patient, and diagnostic tests ordered.

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48	Pettit et al 2017 USA	**Research Paper** High-fidelity simulation - randomly assigned to participate in a simulation of acute coronary syndrome. Students were blinded to study objectives. quantitative data were obtained on the number of times students performed the following patient actions: acknowledged patient by name, asked about pain, conversed, and touching the patient.	To test the effect of socioeconomic status bias on Medical Student–Patient interactions using an Emergency Medicine Simulation.	**Medical Students**	Mannequin - low SES depicted by a homeless person - dirt covered t-shirt and trousers. Mannequin - High SES depicted by executive dress - button down collar suit and tie etc.	**Yes**	Data demonstrate that Medical Students were more likely to ask the simulated patient with high SES about pain control (p = 0.04) and more likely to touch the low SES patient (p = 0.01). Paper discusses touch as a mechanism to communicate compassion - put could also be a display of power. Decision-making does not appear to be different - patient received aspirin and was sent for a cardiac catheterization in both groups.
49	Goddu et al 2018 USA	**Research Paper** Randomized vignette study of two chart notes employing stigmatizing versus neutral language to describe the same hypothetical patient, a 28-year-old man with sickle cell disease.	To assess if words matter… to assess if Stigmatizing Language aids in the transmission of Bias in the medical record	**Medical Students**	Vignette language portraying the patient negatively with irrelevant or unnecessary indicators of lower socioeconomic status such as hanging out with friends outside McDonald's.	**Yes**	Language may play a powerful role in influencing clinician attitudes and behaviour. Less aggressive pain management employed with the hypothetical patient who had low SES.
50	Brandao et al 2019 Portugal	**Research Paper** Two experimental Vignette studies	To investigate classism in pain care and the role of patient socioeconomic status on nurse's pain assessment and management practices	**Nurse** Pain	SES was manipulated by level of education and occupational activity	**Yes**	Overall, the higher-SES patient was perceived as having more intense pain than the lower-SES patients. The low-SES patient's pain was perceived as less credible than the high-SES patient's pain when distress cues were present. Patient SES influenced some of the nurses' pain assessments but not their management practices.

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51	Gonzales et al 2019 USA	**Research Paper** A telephone interviews incorporating Logistic regression models that assessed associations between race/ethnicity/education, medical discrimination, clinician mistrust, and treatment decision-making with concordance	To assess the associations between race/ethnicity/education, medical discrimination, clinician mistrust, and treatment decision-making and guideline concordance.	**Doctors** Cancer	Education level	**Yes**	Intersectionality. Socioeconomic factors influenced guidelines concordance. They found educational disparities in breast cancer treatment. Non-college-educated Black women had lower odds of guideline-concordant care vs. college-educated White women.
52	Hirsh et al 2019 USA	**Research Paper** Vignette style study. A randomized controlled trial.	To test a virtual perspective-taking intervention to reduce race and SES disparities in pain care	**Doctors** Pain	SES was represented visually by work attire: low SES patients - fast food uniform, and high SES – a business suit.	**Yes**	Statistically reliable treatment bias during the pain treatment decision-making pre-intervention. Forty seven percent of providers who were biased at baseline did not show a statistically reliable treatment bias one week later.
53	Vlietstra et al 2020 UK	**Research Paper** Vignette – participants randomised to one of two video vignettes. Representing a psychological assessment session with either a 'lower' or 'upper' class client.	To assess for SES variations in clinical reasoning, namely diagnosis, risk assessment and treatment, and to measure class self-awareness.	**Psychological therapeutic professionals** Working in the NHS	Class The accent and dress of the client were varied to elicit class stereotypes.	**No**	There was little difference in clinical reasoning between the two class conditions. The paper acknowledges that the dress variations did not portray class cues accurately or strongly enough to evoke a difference.
54	Anastas et al 2020 USA	**Research Paper** Vignette - 12 computer-simulated patients with chronic back pain that varied by race and SES (low/high). IAT also employed.	To assess provider attitudes on Chronic Pain Care Decisions.	**Doctors** pain	SES was indicated by occupation and depicted by clothing.	**Yes**	Strong implicit preference for high SES over low SES individuals. There were significant race × SES interaction effects on provider ratings of pain interference, distress, and workplace accommodations.

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55	Bynum 2020 USA	**Research Paper** Four doctors from two Community Health Centres convenient sample because they offer services to uninsured people	To assess the doctor's (Asthma Management) perceptions of uninsured patients.	**Doctors** primary care	Uninsured	**Yes**	3 out of the 4 Doctors indicated that low SES patients have issues with medication compliance. All the participants indicated that access to affordable medication due to patients' SES was a barrier. Paper states that it might be possible to improve physicians' decision-making through techniques that minimize biases.
56	Crandlemire 2020 Canada	**Editorial/Comment** A discussion about the literature regarding healthcare disparities for people with low SES and the role of unconscious biases held among healthcare providers.	Unconscious Bias in Nursing is more likely activated and more prevalent during high pressure or time sensitive scenarios, when people are busy and tired, or when decisions need to be made and there is missing or ambiguous information.	**Nurses** Specialism not specified.	SES	**NA**	Decision-making is influenced by both positive and negative attitudes toward people due to unconscious or conscious biases held by healthcare providers which can affect patient care outcomes.
57	Diniz et al 2020 International (different countries)	**Research Paper** A Mixed methods study. Video vignette: Two women, each doing two different pain-inducing movements. After watching the vignette nurses were asked to: 1. Associate five characteristics to the women. 2. write a brief story to describe 'the woman's pain and how it affects life recommending a treatment.	Examined how nurses' perceptions of pain patients' SES were associated with (more or less) dehumanizing inferences about their pain and different treatment recommendations.	**Nurses** Pain	The video vignette women SES was determined using the MacArthur Scale of Subjective Social Status (based on appearance). Low and middle SES women chosen for the videos.	**Yes**	Words associated with the middle SES women were - calm, friendly, informed, anxious, sociable. Words associated with the lower SES women were - withdrawn, tough, passive, hardworking, worried, poorly informed. Treatment decisions are similar except the low SES patient is referred to psychoeducation- because of a perceived lack of competence.

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58	Veesart et al 2020 US	**Editorial/Comment** A discussion about unconscious bias and how it might impact on nursing care.	Everyone has a cultural lens through which we view the world, which can sometimes create biases. Often, the decisions we make are directly influenced by those biases, even when we espouse other beliefs.	**Nurses** Specialism not specified.	SES	**NA**	Making decisions based on prejudices can have devastating impacts on nursing care. The first step in addressing this is self-awareness. Bias decisions often occur under stressful situations
59	Beyer et al 2021 UK	**Systematic review** Included works published between January 2004 and April 2020. PubMed, Embase and Cochrane Central databases	To assess the current evidence for factors that influence treatment decision-making in localized kidney Cancer	**Multi-Professional** cancer	socio economic status and education status - as reported in the primary papers.	**Yes**	Education status, socioeconomic status, a family history of cancer, and cancer anxiety can be barriers to treatment decisions in kidney cancer. SES and economic variables were identified as barriers to treatment decisions.
60	Chase 2021 USA	**Editorial/Comment** A discussion regarding health disparities research and the negative stereotypes and attitudes that providers can hold toward certain patient groups.	Biased interactions with providers are a dynamic two-way process that can influence patients' satisfaction and trust in the health care provider. Leading to impairments in the patient's health outcomes.	**Muti-professional** Cancer	SES	**NA**	Advantageous and standard-of-care treatments may not be recommended to certain patients because physicians believe that those patients may not adhere to them. When faced with limited time to adequately assess the patient's problem, physicians may rely on their implicit stereotypes to make hasty decisions.

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61	Khidir et al 2021 USA	**Research Paper** Cross-sectional analysis of a sample taken from 100% of Medicare claims for emergency department (ED) visits. ED visits from January 1, 2016, through December 31, 2019. Decision about admission or discharge were analysed according to race, Medicaid, and low income.	To estimate the consistency of ED physician admission propensities across categories of patient sex, race and ethnicity, and Medicaid enrolment.	**Doctors** Emergency care	insurance status - low income.	**No**	Doctors who are more or less likely to admit patients from the ED are more or less likely to do so regardless of SES. No evidence of SES bias and decision-making about admission established.
62	Manzer et al 2021 USA	**Research Paper** Qualitative Interviews	To assess bias through the case of contraception.	**Multi-professional** Family Planning.	SES and Class	**Yes**	Participants link pregnancy risk to women of low SES. Differences in contraception advice found. HPs more likely to steer patients of low SES toward long-acting contraception - can last 1 year or more, rather than prioritizing patients' preferences. HP Bias decision-making may be exacerbated by the fast-paced, high-stress environments and lack of time.
63	Agerstrom et al 2021 Sweden	**Research Paper** A retrospective multiple regression analysis study. Data extracted from Swedish LISA database	To examine SES disparities in In Hospital Cardiac Arrest (IHCA) treatment and survival. Assessing SES at the patient level and controlling other variables to assess impact of SES.	**Multi-professional** Cardiac Care	SES proxy used highest level of completed education and annual income.	**Yes**	Patients with lower SES, low income and low education were all significantly associated with more delay, and lower levels of immediate and long-term survival. People with high SES are more likely to have their heart rhythm monitored prior to the IHCA, despite having better health (less comorbidity). Heart Rhythm monitoring was significantly associated with less delay and increased immediate survival and 30-day survival.

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64	Bernardes et al 2021 Portugal	**Research Paper** Vignette: Drawing on a social psychological model of dehumanization. Two online experimental studies were conducted. vignettes/images depicting 2 cases of women with chronic low-back pain, followed by videos of them performing a pain-inducing movement.	To test the effect of patient socioeconomic status on pain assessment and management. Also, whether patient dehumanization and perceived life hardship mediated these effects.	**Multi-professional** Pain	SES was manipulated: level of education (incomplete high school education Vs degree) and occupation (factory worker Vs Judge).	**Yes**	Medical students: pain assessment was less comprehensive for low SES. They rated the low SES patient as having slightly lower pain intensity during movement but perceived her as more credible and with higher pain-related disability. Nurses: pain assessment was less comprehensive for higher SES. Nurses reported being slightly more willing to offer individualized care to the low SES patient. Lower SES patients were perceived as being more disabled by the pain.
65	Kirkham et al 2022 UK	**Editorial/Comment** A discussion about the Department of Health funded evaluation of the MIDIRS about Informed Choice leaflet. Stereotyping can be a defence mechanism which assisted midwives in coping with the pressures of work.	Midwives sometimes misjudged women's ability and willingness to participate in their maternity care and, therefore, women can be negatively labelled about things like housing tenure or social class [or age].	**Midwives** Maternity	Social class discussed	**NA**	SES stereotyping judgements affect Midwives behaviour. Low SES Women's silence reinforced the staff's perception that 'they don't want information.' It may also enable busy clinics to move at an 'efficient' and 'reasonable' pace.
66	Bruno et al 2022 Canada	**Research Paper** Prospective cross-sectional study from five primary care practices. A randomized controlled trial of a diabetes goal setting and shared decision-making plan.	To assess if SES is associated with empathic communication and decision quality in Diabetes Care.	**Multi-professional** Diabetes	Patient self-reported their ethnicity, education level and income prior to the trial.	**No**	Shared decision-making was not impacted by low education or income.

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67	Torres et al 2022 USA	**Review** Literature review	To assess implicit biases among healthcare providers, the influence of implicit biases on providers' medical judgments and communication, and the mechanisms by which this impaired patient-physician communication affects patients' health outcomes and disease prognoses.	**Doctors** Gynaecology Oncology	Paper discusses SES	**NA**	SES and insurance status impacts on unequal care and quality of care. SES associated with non-adherence to clinical guidelines.

PRISMA 2020 Checklist

Health Professionals implicit bias of patients with low socioeconomic status (SES) and its effects on clinical decision-making: A Systematic Scoping Review

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	4
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	5
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	5-6
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	5
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Supplementary Material
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	6
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	6
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	NA
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	6
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	NA
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	NA
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	NA
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	NA
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	6
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	5-6
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	NA
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	NA
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	NA

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NA
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	7
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	7
Study characteristics	17	Cite each included study and present its characteristics.	Supplementary Material
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	NA
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Supplementary Material
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	NA
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	NA
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	NA
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	NA
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NA
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	NA
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	8-16
	23b	Discuss any limitations of the evidence included in the review.	16
	23c	Discuss any limitations of the review processes used.	16
	23d	Discuss implications of the results for practice, policy, and future research.	16-17
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	NA
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	3 and 5
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	NA
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	19
Competing interests	26	Declare any competing interests of review authors.	19
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Supplementary materials

PRISMA 2020 Checklist

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

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