

BMJ Open Application of Andersen's behavioural model of health services use: a scoping review with a focus on qualitative health services research

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ABSTRACT

Introduction Qualitative methods have become integral in health services research, and Andersen's behavioural model of health services use (BMHSU) is one of the most commonly employed models of health service utilisation. The model focuses on three core factors to explain healthcare utilisation: predisposing, enabling and need factors. A recent overview of the application of the BMHSU is lacking, particularly regarding its application in qualitative research. Therefore, we provide (1) a descriptive overview of the application of the BMHSU in health services research in general and (2) a qualitative synthesis on the (un)suitability of the model in qualitative health services research.

Methods We searched five databases from March to April 2019, and in April 2020. For inclusion, each study had to focus on individuals ≥ 18 years of age and to cite the BMHSU, a modified version of the model, or the three core factors that constitute the model, regardless of study design, or publication type. We used MS Excel to perform descriptive statistics, and applied MAXQDA 2020 as part of a qualitative content analysis.

Results From a total of 6319 results, we identified 1879 publications dealing with the BMHSU. The main methodological approach was quantitative (89%). More than half of the studies are based on the BMHSU from 1995. 77 studies employed a qualitative design, the BMHSU was applied to justify the theoretical background (62%), structure the data collection (40%) and perform data coding (78%). Various publications highlight the usefulness of the BMHSU for qualitative data, while others criticise the model for several reasons (eg, its lack of cultural or psychosocial factors).

Conclusions The application of different and older models of healthcare utilisation hinders comparative health services research. Future research should consider quantitative or qualitative study designs and account for the most current and comprehensive model of the BMHSU.

INTRODUCTION

Healthcare utilisation refers to the use of the healthcare system 'by persons for the purpose of preventing and curing health problems, promoting maintenance of health and well-being, or obtaining information about one's health status and prognosis'.¹ A needs-based

Strengths and limitations of this study

- Explores the application of the widely adopted behavioural model of health services use without limiting the search on target group, care setting or disease.
- Might have missed studies that did not mention the behavioural model of health services use, or the three core factors in the title and abstract of the publications.
- Gives insights to the application of the behavioural model of health services use in qualitative research which have received little attention so far.

healthcare system meets the needs of a person objectively identified by (health) professionals and considers the demands of an individual. If this interaction is successful, overuse, underuse and misuse of healthcare systems can be avoided. Otherwise, there is the possibility of compromising the health of an individual and placing burden on the healthcare system.² To avoid overuse, underuse and misuse of the healthcare system, it is important to consider the (non-)use of healthcare services, which is determined by a variety of contextual and individual factors.³ As a measurable construct, healthcare service utilisation is primarily determined through quantitative surveys. To explore individual demands, qualitative methods can provide important and rich information within the field of health services research.^{4 5} Various models have been developed across a variety of disciplines to explore and predict individuals' intentions and behaviours as they utilise healthcare services.⁶ In health services research, the behavioural model of health services use (BMHSU) is the most frequently cited model of healthcare service utilisation.⁶ The model was developed by Andersen, and was based on a national quantitative survey that aimed to understand families' use of

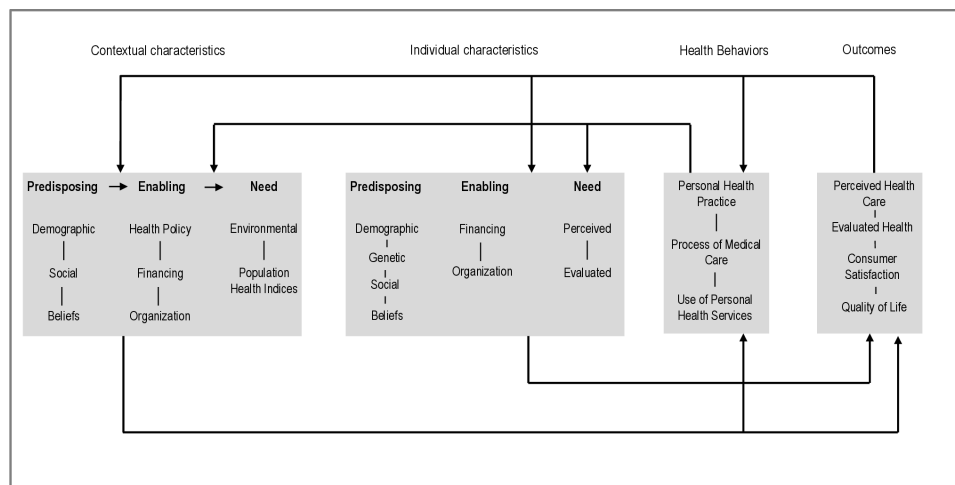


Figure 1 Andersen's behavioural model of health services use.¹⁵

health services.^{7,8} The model focuses on three core factors to explain healthcare utilisation: predisposing factors (eg, age, education), enabling factors (eg, income, hospital density) and need factors (eg, health status).⁸

In recent years, Andersen's initial behavioural model has undergone continuous development, where new focus was placed on various factors,^{8–10} such as 'consumer satisfaction' in the 1970s,^{11,12} and 'health status', 'personal health practice' and 'external environment' in the 1980s.^{9,13} In 1995, Andersen himself reviewed the model and its development and has since included feedback loops to consider how treatment outcomes affect health behaviour.⁸ Additional 'contextual and individual characteristics' were added to the model in the 2000s.⁸ Some of these further developments were carried out in cooperation with other authors, for example, Andersen and Newman's Framework of Viewing Health Services Utilisation¹¹ or Aday and Andersen's Framework for the Study of Access to Medical Care.¹² The BMHSU was modified for specific settings (eg, complementary and alternative medicine¹⁴) and for specific target groups (eg, the behavioural model for vulnerable populations for homeless people¹³). Currently, many versions of the model for different settings or target groups are available and applied in health services research. The most current and comprehensive model is the BMHSU of the year 2013¹⁵ (figure 1). The main focus of that model is on the factors that facilitate or impede an individual's access to healthcare services. According to the model, access is determined by contextual characteristics, individual characteristics, health behaviours and outcomes. Contextual characteristics include circumstances and the environment; individual characteristics are determined by a person's life circumstances including, for example, genetics and socialisation; health behaviours are an individual's personal practices; and outcomes are reflected by an individual's health status and consumer satisfaction.

The application of the BMHSU and its different versions has already been examined in several systematic reviews. These are, for example, reviews focusing on specific

diseases¹⁶ or settings.¹⁷ The most recent systematic review from Babitsch *et al*⁸ has examined the application of the BMHSU in general healthcare, but excludes specific care settings (eg, maternal health), specific target groups (eg, veterans) and studies that focus on specific diseases (eg, HIV).³ These reviews considered quantitative studies only, and excluded qualitative studies, although qualitative methods have become an important and integral part of health services research, and are useful for recording detailed descriptions and complex issues in the context of healthcare utilisation and healthcare services.^{4,5} Even though the BMHSU is the most frequently cited model of access to healthcare services,⁶ an overview of the development and application of the BMHSU over the last 50 years is lacking, especially in terms of its application in qualitative research.

Primarily we aimed at a review of qualitative applications of the BMHSU. We learnt from exploratory searches that its application in qualitative research will be difficult to find. That was when we decided to undertake a meticulous screening of titles and abstracts of publications dealing with the BMHSU, to provide a descriptive overview on study characteristics as a first step, to learn about the application of the model in general which would help to put the qualitative findings into perspective. In a second step, we focus on a qualitative synthesis of the application of the BMHSU in qualitative health service research. Here, we synthesise (1) the application of different versions of the BMHSU, (2) the (un)suitability of the BMHSU from the authors' perspective and (3) which factors of the BMHSU were analysed in publications with qualitative approach. Further analyses, for example, the synthesis of the quantitative studies is object of future publications.

METHODS

This scoping review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)¹⁸ (online supplemental

additional file 1). It exists no review protocol. For study selection, two researchers (ML and JT) independently screened all selected titles and abstracts for relevance. For the descriptive overview, data extraction from title and abstract was divided between two researchers (ML and JT). One researcher's extraction was verified by the other researcher with extracting data of a 25% random sample and discrepancies were resolved through discussion. For the qualitative synthesis, the full texts were independently screened for eligibility and the data were independently extracted by two researchers (ML and JT). Two researchers (ML and JT) coded the material together. Through all these processes, discrepancies were discussed and resolved by a team of reviewers (ML, JT and EMB).

Patient and public involvement

No patient involved.

Search strategy

We conducted a systematic literature search in March and April 2019, and performed an updated search in April 2020 using the Embase via Ovid, Medline via PubMed, CINAHL and PsycINFO via EBSCOhost and Social Science Citation Index via Web of Science databases.

We expanded the search strategy of Babitsch *et al*³ *inter alia* without limitation on the target groups, care settings and diseases of interest. We adjusted the search terms to the particular databases and combined thesaurus and keywords pertaining to the BMHSU and its three core factors. The detailed search strategy for one database is identified in online supplemental additional file 2. The search was conducted for publications published from 1968 to April 2020. **Figure 2** shows the study selection process according to the PRISMA statement.

Descriptive overview

Study selection

As an initial first step, title-abstract-screening was performed for all search results. We included all publications focused on adult populations that applied either the BMHSU, a modified version of the model, or all three core factors of the model. No limitations were set for language, study design, or publication type. Studies were excluded if they could not be obtained via electronic access, interlibrary loan or through contact with the authors.

Data extraction

The following inductively formed characteristics were extracted from the title and abstract of each included study: publication year, first author, region, methodological approach, target group, care setting and the applied version of the BMHSU. Beyond labelling included studies as quantitative, qualitative or mixed-methods we undertook no attempt to specify details of the study design, quantify reporting quality or risk of bias. Such a strategy is consistent with scoping reviews.¹⁸ For abstracts with insufficient information regarding our extraction characteristics, we obtained the full-text version of the publications.

Data analysis

We calculated descriptive statistics with MS Excel for the descriptive overview.

Qualitative synthesis

Based on the data extraction of the descriptive overview, we obtained the full texts of all publications with a qualitative approach, either specifically or as part of a mixed-method design. Finally, we screened the full-texts of the remaining results and excluded publications with no relation to the BMHSU in the qualitative part (**figure 2**).

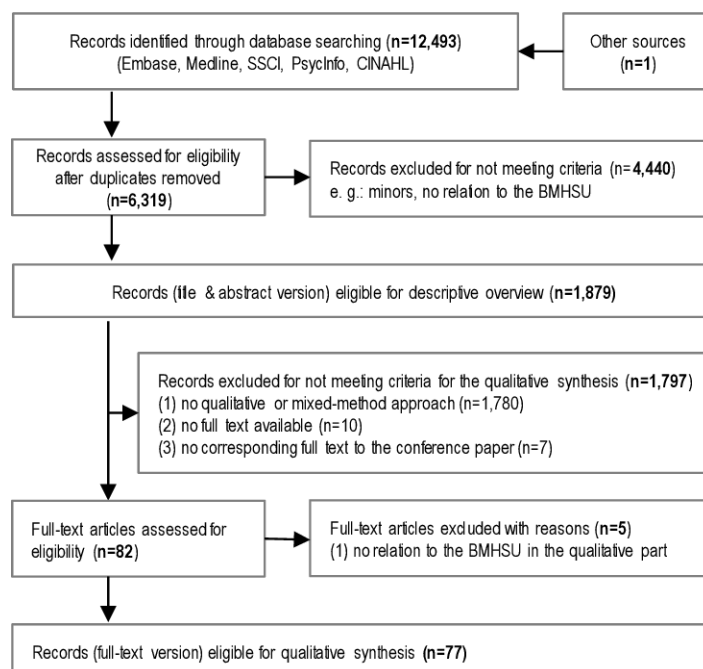


Figure 2 Flow diagram based on PRISMA. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Quality appraisal

The quality of the qualitative studies and the qualitative part of studies with a mixed-method design was assessed independently by two researchers (ML and JT) using the 'Critical Appraisal Checklist for Qualitative Research'.¹⁹ Authors resolved disagreement by discussion. The checklist contains ten items that assess the methodological quality of the design, data collection and data analysis of the publications. The tool comprises four answer choices: 'yes', 'no', 'unclear' and 'not applicable'. If there was insufficient information to answer a given question, the response was recorded as 'unclear'. We included all studies with qualitative and mixed-method approach in the qualitative synthesis regardless of the analysed quality of the studies.

Data analysis

For the qualitative synthesis, MAXQDA 2020 software was used.²⁰ To answer the research questions, the following deductive codes were coded in the data material: applied version of the BMHSU, the way in which the model is applied in qualitative studies, the potential for and limitations of the BMHSU, and the extensions of the BMHSU described by the authors. The subcode 'potential and limitations of the BMHSU' is based solely on descriptions and conclusions of the authors of the individual publications. In addition, we considered which of the BMHSU factors were examined and which were complemented by inductive factors that emerged from the data material. We distinguished between the three core factors (predisposing factors, enabling factors and need factors) and the associated factors (eg, demographics, health policy and perceived need). We recoded all documents with the final coding frame. In the context of the content-structuring qualitative analysis, the summarising reduction of the coding followed the approach detailed by other researchers.²¹ The presented results are structured based on these main categories.

RESULTS

Descriptive overview of the use of the BMHSU in health services research

After removal of duplicates 6319 records remained of which 1879 dealt with the BMHSU, with its three core factors, or a modified version of the model (figure 2).

Starting with the initial use of the model in 1973, reception toward the model has increased considerably in recent decades (table 1). Two-thirds of all identified publications were published in the last ten years (ie, since 2010), and more than 50% of the publications have been published since 2013. Further, 70% of the publications are from North-America (USA or Canada), followed by Asia (13%) and Europe (9%). The majority are quantitative studies (n=1680, 89%), while 4% of all records are qualitative studies (n=69) and 3% are reviews (n=61). In all, 30 publications are mixed-method studies (2%) and 39 publications (2%) are theoretical reflections

without empirical data. As there are numerous diverse care settings, target groups and diseases of interests, table 1 presents the three most frequent categories. An overview of the broad range of the characteristics can be found in online supplemental additional file 3. General healthcare, as care provided by general practitioners, is the most studied care setting (n=471, 25%), followed by nursing care (n=237, 13%) and mental health services (n=222, 12%). About one quarter of all studies deals with individuals aged ≥ 50 years (n=481). In addition, 17% of the publications focus on migrants (n=322), and 14% on women (n=256). Half of the publications (n=936) do not account for a specific disease; for 12% (n=229) of all publications, mental disorders represent the most frequently examined diseases of interest.

Qualitative synthesis of the use of the BMHSU in qualitative health services research

After excluding publications without a qualitative or mixed-method approach (n=1780), those without a full text available (n=10), those without a corresponding full text to a conference paper (n=7), and those that were not at all related to the BMHSU in the qualitative part (n=5), a total of 77 studies remained and were included in the qualitative synthesis of qualitative studies applying the BMHSU (figure 2).

Although the first known application of the BMHSU in a qualitative study was from 2002, most of the qualitative records were identified in 2010 and later (n=70, 91%; table 1). Most publications are from North-America, USA or Canada (n=43, 56%), 18% (n=14) are from Europe and 16% (n=12) are from Africa. General healthcare is the care setting that was explored most often in publications adopting a qualitative study design (n=12, 16%), followed by screening and perinatal care (n=7 each, 9%). Qualitative research applying the BMHSU primarily targets migrants (n=23, 30%), women (n=16, 21%) and individuals aged ≥ 50 years (n=11, 14%). Further, 35% of qualitative publications (n=27) address no specific disease; if a particular disease was of interest, it is most often HIV (n=11, 14%) or cancer (n=9, 12%).

Two-thirds of the qualitative studies use personal interviews as a data collection method (n=51, 81%). The sample size varies between 5 and 470 participants. Most of the qualitative studies interview the target group directly (n=65, 84%). Health professionals and/or next of kin assessments are the sole source of information in 12 studies (16%). In addition, 18 of the 65 qualitative studies that approached the target group obtained further information from health professionals (n=13), next of kin (n=1), or both (n=4; for further details; online supplemental additional file 4).

Application of the different versions of the Andersen model

The BMHSU is applied in the various studies to justify the theoretical background (62%), structure the data collection (40%), for example, such as aiding in the development of the interview guide, and for data coding

Table 1 Quantitative description of publications using the behavioural model of health services use in health services research

	Descriptive overview (n=1879) (based on title and abstract) n (%)*	Qualitative synthesis (n=77) (based on full text version) n (%)*
Year		
2010-2019	1224 (65)	70 (91)
2000-2009	440 (23)	7 (9)
1990-1999	168 (9)	0 (0)
1980-1989	38 (2)	0 (0)
1968-1979	9 (0)	0 (0)
Region		
North-America	1275 (70)	43 (56)
Asia	244 (13)	6 (8)
Europe	163 (9)	14 (18)
Africa	68 (4)	12 (16)
South America	49 (3)	2 (3)
Oceania	29 (2)	5 (6)
Methodological approach		
Quantitative	1680 (89)	/
Qualitative	69 (4)	58 (75)
Review	61 (3)	/
Theoretical	39 (2)	/
Mixed-method	30 (2)	19 (25)
Care setting†		
General health care‡	471 (25)	12 (16)
Nursing care§	237 (13)	5 (6)
Mental health services	222 (12)	6 (8)
Screening	107 (6)	7 (9)
Perinatal care¶	77 (4)	7 (9)
Target group†		
Individuals ≥50 years	481 (26)	11 (14)
Migrants	322 (17)	23 (30)
Women	256 (14)	16 (21)
Disease of interest†		
No specific disease	936 (50)	27 (35)
Mental disorders	229 (12)	7 (9)
Cancer	134 (7)	9 (12)
HIV	96 (5)	11 (14)

*The sum might be less than 100% as only the three most frequent categories are represented in this table. Online supplemental additional file 3 shows all characteristics.

†Bold: three most frequent categories.

‡General healthcare: care provided by general practitioners.

§Nursing: homecare, long-term care, formal care, care facility, informal care, respite care, institutionalised care and transportation services.

¶Perinatal care: including midwifery services.

(78%). More than half of the studies (n=42)²²⁻⁶¹ are based on the BMHSU from 1995.⁹ Multiple studies (n=11) use the behavioural model for vulnerable populations.⁶²⁻⁷¹ Twelve studies^{30 41 54 60 72-79} employ Andersen and Newman's Framework of Viewing Health Services

Utilisation, eight studies^{41 42 80-85} apply Aday and Andersen's Framework for the Study of Access to Medical Care and seven studies^{41 47 51 54 58 60 86} are based on the original Behavioural Model of Families' Use of Health Services from 1968. Individual studies use other models, such as

the expanded model from Bradley *et al*²⁸ (online supplemental additional file 4).

(Un)suitability of the Andersen model from the authors' perspective

Overall, 29 publications^{22 30–32 34 35 39 41 42 44 45 47 48 50 52 54 55 68 71 72 77–79 82 87–91} described that the model was suitable in their work, for example, to obtain and evaluate qualitative data. Of these, 17 publications^{34 35 39 42 44 45 48 50 52 72 77–79 82 87 88 91} highlight the general suitability of the BMHSU for qualitative data: 'Andersen's framework provides a valid, consistent and unbiased manner in which to code and classify qualitative data'.⁸⁸ Various publications (n=17)^{34 39 42 44 45 48 50 52 54 57 72 77–79 87 88 92} described how their data can be applied very well to the BMHSU and its factors. Others described that the strength of the model lies in its consideration of both patient-related and environmental factors,^{39 50 90} and that the model allows for 'a more transparent comparison with findings emerging from other studies'.⁸⁷

Some studies (n=11) described the suitability of the BMHSU and additionally criticised some parts of the model.^{22 31 35 39 48 52 54 89 91–93} For instance, there are authors (n=8) who criticised the model, but did not propose changes to its structure.^{22 25 35 48 89 91–93} Some studies^{22 25} described that cultural factors are not adequately represented in the model: 'the model has been noted not to be sensitive to the diverse cultural and structural barriers

in healthcare among minority groups'.²⁵ According to the authors of some publications,^{35 48} the model would need to further elaborate on the relationship between the three core factors of the BMHSU and the relevance of each. Other authors claimed that the model does not cover all factors of healthcare utilisation, such as psychosocial factors,²² and would be less suitable for studies on HIV⁸⁹ or healthcare coverage.⁹³

Not all critics proposed model modifications, but some of the identified limitations may lead to modifications of or additions to the BMHSU. Based on their findings, some authors (n=12) identified additional factors not covered by the model that impact healthcare utilisation,^{23 28 31 36 37 39 54 57 74 80 85 90} such as health literacy,^{39 54 90} or competing priorities^{23 39} (table 2). The basic structure of the BMHSU is retained as part of these expansions.

Other studies fundamentally changed the original structure of the BMHSU, both in terms of the factors^{24 38 74} and the feedback loops provided,^{39 52 62} ultimately impacting the influence between each of the factors in the model. Some studies emphasised the distinction between the three core factors as predisposing and inhibiting factors, and as enabling and impeding factors,^{24 26 62} while others combined the model with another model.⁶¹

Table 2 Additions to the behavioural model of health services use (BMHSU) from qualitative health services research

Contextual characteristics	Individual characteristics			Health behaviours	Outcome	Further additions
	Predisposing factors	Enabling factors	Need factors			
Intake and engagement ³⁶	Competing priorities ^{23 39}	Medication characteristics ³⁹	Unmet need ³¹	Distinction between problem recognition, decision to seek help and decision to use healthcare system ⁷⁴	Dental service use and dental experiences ⁵⁷	Psychosocial factors ²⁸
Patient and transition ³⁶	Fear ²³	Reminder strategies ³⁹				
Medication adherence strategies ³⁶	(Mis)trust ^{23 90}	Personal emergency alarm system ³¹				
Billing ³⁶	Previous experiences ^{23 90}	Informal care system ³¹		Avoidant strategies ⁵⁴	Intended and actual use ^{28 57}	Situation and satisfaction of the next of kin ⁸⁰
Specific programme for support ³⁶	Contingency plans for future falls ³¹	Characteristics at the level of informal caregivers ³⁷ :	Mental health ⁸⁵	Spirituality ⁵⁴	Service experience ⁵⁷	Vulnerability factors ⁷¹
Health Literacy ³⁶	Health literacy ^{39 54 90}	Physician referral, knowledge about the services, acculturation				
Individualised care ³⁶	Characteristics at the level of informal caregivers ³⁷ : Familism, perception about services, religiosity, gender roles					
Philosophical approaches ³⁶						
Pharmacy services ³⁹						
Rheumatologist ⁹⁰	Conscientiousness ⁹⁰					

The table shows the variables as the authors of the original studies assigned them to BMHSU core factors.

Factors of the BMHSU emerging from qualitative health services research

Individual characteristics are considered much more frequently than contextual characteristics, health behaviours or health outcomes in publications that adopted a qualitative design. Table 3 lists all factors of the BMHSU with the number of publications that used each factor. Although the qualitative studies explored in our research considered a wide range of factors, there are still some other factors of the BMHSU that have not been considered in any of the included publications that featured a qualitative study design (eg, quality of life as an outcome factor or some predisposing factors as contextual characteristics).

Contextual characteristics: A total of 63 qualitative studies (82%) mentioned contextual characteristics, of which enabling factors are most frequently included, such as health professional factors, for example, soft skills (n=22, 29%) or availability (n=21, 27%).

Individual characteristics: The most frequently researched factors pertain to individual characteristics, especially predisposing factors such as social networks (n=41, 53%), attitude towards healthcare services (n=33, 43%) and values (n=28, 36%). Nearly half of all studies considered accessibility of healthcare services as an enabling factor (n=34, 44%). The most common need factor was perceived symptoms (n=45, 58%).

Health behaviour: In terms of health behaviour, the relationship between the patient and provider (n=21, 27%), as well as complementary medicine (n=13, 17%) and self-care (n=11, 14%) were most often analysed in publications adopting a qualitative design.

Outcomes: Overall, about half of the qualitative studies (n=37) mentioned health outcomes in their analyses. Satisfaction with providers (n=18, 23%) and prior experience (n=17, 22%) were the most considered aspects.

During our qualitative syntheses of qualitative health services research studies, health literacy emerged as an inductive category, separated into individual⁹⁴ and organisational health literacy.⁹⁵ We identified associations with organisational health literacy in 25 studies (32%) and individual health literacy in 52 studies (68%; table 3). In the context of organisational health literacy, the focus was on access to health information: 'share health risk information while empowering patients to make their own health decisions'.³⁶ The most frequently mentioned factors among individual health literacy were knowledge (n=39, 51%) and competences (n=22, 29%), as exemplified by the following statement: 'knowledge was empowering to make own choices and feel in control of their care decisions'.²⁷

Quality assessment of publications with a qualitative study design

Of the 77 qualitative studies, four (5%) reported all ten aspects of the critical appraisal checklist for qualitative research.¹⁹ Most qualitative studies (n=69, 90%) reported between five and nine criteria from the checklist, and

four studies (5%) reported fewer than five criteria. The two quality criteria that were most frequently fulfilled with 95% each (n=73) are the 'congruity between the stated philosophical perspective and the research methodology' and the 'congruity between the research methodology and the methods used to collect data'.¹⁹ In contrast, the 'influence of the researcher on the research, and vice-versa'¹⁹ is only addressed in nine publications (12%).

DISCUSSION

This scoping review provides a recent overview of the development and application of the BMHSU in very different care settings, across different diseases and among publications examining different target groups. The BMHSU is mainly used in quantitative studies, but our review also shows the suitability of the model in qualitative research.

Descriptive overview of the use of the BMHSU in health services research

The general reception toward the BMHSU has increased considerably in recent years, as has the number of publications adopting this model, with most (70%) of all related publications stemming from North America. This is in line with another review,³ which excluded specific care settings and diseases. The dominance of research projects adopting quantitative design⁹⁶ is reflected in this scoping review, as 89% of the identified publications used quantitative methods.

The BMHSU is mainly used for research examining healthcare in general, without focusing on specific diseases. This is not surprising, as the recent BMHSU was not developed for any specific care setting or disease.¹⁵ Still, a wide range of publications have focused on specific care settings (eg, nursing, mental health services) and diseases (eg, mental disorders). Individuals aged ≥ 50 years are the largest target group represented in this overview. Possible explanations for this finding include the fact that this population represents the largest, and fastest growing cohort in the broader population.⁹⁷ Further, this group uses healthcare services most frequently.⁹⁸

Qualitative synthesis on the use of the BMHSU in qualitative health services research

The relevance of the BMHSU for qualitative projects within health services research is demonstrated by our results. Still, there are some limitations within the BMHSU, which should be critically considered depending on the research question.

The publications featuring a qualitative design mainly consider the individual characteristics within the BMHSU. Since the primary interest of qualitative research is the subjective experience of individuals, this result is not surprising.⁹⁹ In addition, it was noted that people from the target group were primarily interviewed in these studies, while there were fewer next of kin or health professionals interviewed. Experts may wish to

**Table 3** Factors examined in publications

Factors	N	References
Contextual characteristics		
Predisposing factors		
Demographic	1	91
Social	/	/
Beliefs		
Stigma*	14	33 44 45 52 60 64 66 71 77 84 85 88 89 100
Culture*	5	23 40 44 46 77
Social norms*	5	34 40 76 77 87
Gender roles*	3	27 66 100
Enabling factors		
Health Policy	7	42 57 61 83 84 91 101
Financing	12	34 36 41 50 61 64 83 88 90 91 102 103
Organisation		
Health professional factors*	22	24 31 34 36 39 42 43 50 53 58 61 69 79 81 82 84 88 90–92 101 104
Availability*	21	23 24 28 33 39 41 42 47 50 53 59 61 64 74 80 87 90 92 101 103 105
Additional healthcare services*	12	26 36 52 72 75 76 80 81 88 90 101 104
Cultural/linguistic suitable services*	9	23 31 37 40 62 66 71 84 85
Cooperation*	5	23 77 80 81 101
System complexity*	6	34 64 80 82 84 105
Quality of care*	6	26 34 42 59 80 90
Interpreters*	2	23 69
Need factors		
Environmental	3	50 89 91
Population health indices	/	/
Individual characteristics		
Predisposing factors		
Demographic		
Immigration status*	7	31 53 56 57 70 71 105
Gender	2	62 64
Age	13	24 25 44 50 53 57 58 61 62 78 79 93 105
Genetic	2	46 101
Social		
Social network	41	25 26 28–31 33 35 39–42 47–50 54 56–58 60 62 64 66 67 75 77–82 84 85 87 89 92 93 103 105 106
Personal skills*	16	26 29 39 43 45 51 65–67 69–71 75 77 81 85
Competing priorities*	12	22–24 30 34 39 50 66 77 81 87 93
Living conditions*	10	39 41 47 49 65 66 70 80 88 89
Education*	5	47 57 61 87 90
Beliefs		
Attitude towards healthcare services	33	23 26–29 31 34 40–42 45 47–50 52 59 61 63 74 77–80 85 87 88 90 92 102 103 105 106
Fear*	27	22–24 34 35 39 40 46 49 50 52 56 60–62 64 67 70 74 76–78 84 87 88 104 105
Values	28	23 25 26 29 31 33 34 40 46 48 53 54 56 57 60 62 66 67 70 71 74 81 84 86 87 92 103 106
Attitude towards health professionals	12	27 32 37 43 45 47 48 60 76 87 102 105
Enabling factors		
Financing		
Financial resources	25	22 25 28 41 42 48–53 57 62 65 67 70 71 77 78 87 90 93 102 103
Insurance	18	22 29 34 39 43 45 51 53 63 64 70 71 87 90 92 93 105 106
Income	8	28 29 53 64 70 87 92 106
Organisation		

Continued

Table 3 Continued

Factors	N	References
Accessibility*	34	22–25 29 34 39 41 42 44 47 48 50 52 57 61 64 65 71 74 77 78 81 82 87–90 92 102–106
Stable routine*	6	64 74 75 88 89 103
Reminder strategies*	3	39 50 52
Social Support		
General*	12	47 48 50 63 66 75 77 79 82 87 89 103
Tangible	18	26 31 33 39 41 49 50 64 66 75 78 80 86 90 92 93 105 106
Emotional/affectionate	15	22 24 25 29 35 49 50 54 62 64 66 75 77 80 82
Informational	11	22 25 40 42 67 75 78 81 86 89 92 103 106
Need factors		
Perceived		
General*	10	30 31 33 58 64 73 78 86 92 106
Symptoms	45	22–26 30 35 39 41–43 46–50 53 54 57–60 62 64 66 67 70 74 75 77 78 80 85 87 90 93 100 102–104 106
Evaluated	20	25 30 33 35 41 55 58 59 62 75 78–80 82 85 90–92 103 106
Health behaviours		
Personal health practice		
Complementary medicine*	13	25 29 44 53 54 57 64 77 78 86 87 90 102
Self-care	11	24 29 46 48 64 74 86 87 89 102 103
Adherence	8	36 39 50 63 65 90 103 105
Diet	4	47 48 64 86
Process of medical care		
Relationship patient-provider	21	23 26 27 39 50 52 60 66 67 70 72 74 75 77 82 84 88–91 103
Second medical opinion*	1	50
Use of personal health services	77	22–54 56–67 69–93 100–106
Outcomes		
Perceived health status	5	41 48 77 90 91
Evaluated health status	1	64
Consumer satisfaction		
General*	2	82 91
Prior experiences*	17	22 23 25 27 45 47 51 55 57 67 71 74 80 82 100 102 103
Waiting time	5	22 42 45 82 87
Satisfaction with providers*	18	22 26 34 35 45 47 48 55 71 72 75 76 80 82 84 87 102 103
Satisfaction with care facility*	8	29 37 41 59 78 82 93 103
Quality of life	/	/
Health literacy		
Organisational health literacy*		
Access to health information*	25	22–24 27 30 32 36 39 40 46–49 69 74–76 83 84 90 92 93 103
Individual health literacy*		
Literacy*	2	61 103
Knowledge*	39	23 26–28 30–37 40 42 44 46–52 54 57 62 67 69 73–78 84 87 90 92 104 105
Motivation*	4	34 75 77 102
Competences*	22	22 23 27 29 32 37 39 48 50 52 56 61 63 64 67 70 74 75 82 89 105 106

*These factors were inductive codes, developed along the data material.

consider obtaining more information about contextual characteristics in their research. Since the data extraction within the descriptive overview was carried out at the level of titles and abstracts, it is not possible to determine whether contextual characteristics in publications featuring a quantitative study design are more strongly represented in this review.

Although over half of all publications that adopted a qualitative design had been published since 2013, most of them considered the Andersen model of 1995, which is also a result of the review by Babitsch *et al.*³ Only one of the publications with a qualitative design⁵⁴ adopted the most current and comprehensive BMHSU from the year 2013.¹⁵ This is interesting, as some authors expanded



on an older version of the BMHSU and justified various missing factors (eg, provider negligence and dissatisfaction, location of a clinic), although these factors are actually included in the most current version of the BMHSU from 2013.¹⁵ It is important to consider that even Andersen himself had additional thoughts on the model.⁹ For example, he coauthored a publication with the aim to expand the view from the original model on psychosocial factors.²⁸

One new factor that has been discussed in some of the considered studies is health literacy. Health literacy relates to many parts of the Andersen model and cannot be assigned to a specific level or factor. We recommend integrating health literacy as an additional factor in the BMHSU, as an individual's health literacy and health-literate organisations are important foundations for the (non-)use of healthcare services, and consequently for healthcare research.^{94 95}

Strengths and limitations

When interpreting the results, it should be noted that although we performed systematic searches, some publications might have been missed. For example, articles that did not mention the BMHSU, or the three core factors in the title and abstract were not included. Further, articles may have been excluded given that we restricted our search to five databases. However, it became apparent, that all previously known key publications have been identified through our search strategy.^{3 8 9 11 12} Another limitation is that the extraction of publication characteristics for descriptive overview was divided between the first authors (ML and JT) and were not extracted twice. For the qualitative synthesis, the data extraction was performed on full texts independently by two researchers. Also, the quality of this scoping review is based on the quality of the information contained in the included publications. We considered the general utilisation of the BMHSU in health services research (as identified in the descriptive overview) at the title and abstract level, and not at the full-text level. An analysis of the full-texts could provide further information about, and more detailed insights into, the application of the BMHSU. When coding the results based on the various model factors, one challenge faced by our team was appropriately assigning the factors, as the assignment of the factors was not always clear. The detailed description of the current BMHSU by Andersen *et al*¹⁵ served us substantially for the assignment of the factors. Any uncertainties were discussed in the review team. Also, our comparison of the various studies that adopted a qualitative design is limited by the fact that very different versions of the model were used.

Regarding the influence of the reviewers on the review, it should be mentioned that the review team was composed of individuals with experience in systematic reviews, health services research and qualitative methods. The review team had no affiliation with the research and no funding for the review. It should be noted that this scoping review is the first to explore the application of

the widely adopted BMHSU without limiting our search based on target group, care setting, or disease since the model was initially published in 1968. Further, this review examined publications adopting qualitative study designs, strengthening the perceptions of qualitative methods in health services research. This review provides the first-ever overview of the (un)suitability of the BMHSU in qualitative research.

CONCLUSION

This scoping review reveals that the BMHSU, which is one of the main models in healthcare services research, has broad applications in very different care settings, across various diseases, and focuses on a wide range of target groups. The BMHSU is mainly used in quantitative studies, but our review also shows the suitability of the model for qualitative research. As health literacy in particular plays an increasingly important role in healthcare utilisation,⁹⁴ we think it is important to take this factor into account in the BMHSU. In further research, it would be interesting to examine this relationship more thoroughly. Additionally, it might be interesting to compare the application of the BMHSU in quantitative and qualitative research. The application of so many different (and older) models of healthcare utilisation makes it difficult to compare the individual studies with one another. However, such a comparison would be particularly important in the context of health services research. For future health services research, the current and most comprehensive version of the BMHSU¹⁵ should always be considered.

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