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Choosing a health behaviour theory or model for related research projects: a narrative review

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Abstract

Background: Theories are integral to a research project, providing the logic underlying what, how, and/or why a particular phenomenon happens. Alternatively, models are used to guide a research project by representing theories and visualising the structural framework of causal pathways by showing the different levels of analysis. With the rise in chronic and behaviour-related diseases, health behaviour theories and models have a particular importance in designing appropriate and research led behavioural intervention strategies. However, there is a dearth of papers that explain the role of behavioural theories and models in research projects.

Aims: The aim of this paper is to synthesise existing evidence on the relevance of health behaviour theories and models in research projects.

Methods: This paper reviews health behaviour theories and models commonly underpinning research projects in public health and clinical practices. The electronic databases, such as MEDLINE, CINAHL, and Scopus, as well as the search engines Google and Google Scholar were searched to identify health behaviour theories and models.

Results: Theories and models are essential in a research project. Theories provide the underlying reason for the occurrence of a phenomenon by explaining what the key drivers and outcomes of the target phenomenon are and why, and what underlying processes are responsible for causing that phenomenon. Models on the other hand provide guidance to a research project and assist in visualising the structural framework of causal pathways by showing the different levels of analysis.

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Health behaviour theories and models in particular offer valuable insights for designing effective and sustainable research projects for improved public health practice.

Conclusions: By employing appropriate health behaviour theory and/or model as a research framework, researchers will be able to identify relevant variables and translate these into clinical and public health practices.

Keywords
health behaviour, model, researcher, research project, theory

Introduction

Theory is a way to understand reality better and is integral to research (Reeves et al., 2008). Theory includes ideas like a clear hypothesis (which is only applicable in quantitative research), to working models and frameworks of thinking about reality (Alderson, 1998). Meleis (2011: 29) defined a theory as:

> *an organised, coherent, and systematic articulation of a set of statements related to significant questions in a discipline and communicated as a meaningful whole. It is a symbolic depiction of those aspects of reality that are discovered or invented for describing, explaining, predicting, or prescribing responses, events, situations, conditions, or relationships.*

Models are used to represent theories and to guide research projects. Models typically visualise the structural framework of causal pathways by showing the different levels of analysis (Meleis, 2011). Theory provides the logic behind what, how, and/or why a particular phenomenon might occur (Kitchel and Ball, 2014). A research project that is rooted in theory enhances knowledge (Leshem and Trafford, 2007; Sinclair, 2007), and therefore linking the theoretical framework of a research project to established and comprehensive theories is important. The theoretical framework provides a conceptual basis for understanding and designing an appropriate methodology to explore a given problem (Grant and Osanloo, 2014; Lester, 2005), serving as a foundation for a research project, and guiding all of the activities related to that particular project (Fox et al., 2015; Lester, 2005).

There are many theories and models that have been developed for the purpose of gaining a better understanding of health behaviour and influencing factors. These include, but are not limited to, the theory of planned behaviour (TPB), the theory of reasoned action, social cognitive theory (SCT), the health belief model (HBM), the behavioural model of healthcare utilisation, the trans-theoretical model of change, the ecological model, the biomedical model, and the biopsychosocial model. Theories cannot be described as right or wrong, but they do vary in their relevance to inquiries. Every theory can provide a distinct way of observing a problem, allowing its investigation from different perspectives and a more complete understanding of its facets (Reeves et al., 2008). The selection of a theory that best fits a particular study is about justifying that the chosen theory meets the research questions, the structure of the research, and the research design (Grant and Osanloo, 2014). Theoretical triangulation (combining two or more theories in a given research project), too, has been argued to provide the opportunity to address the issue being studied comprehensively, and to increase the validity of the explanations generated (Ngulube et al., 2015; Rimer and Glanz, 2005). Theories and models significantly influence the way evidence is gathered, analysed, interpreted, and used (Alderson, 1998). For this reason, the most-often used theories and models of health behaviour for framing the

structure of robust research projects in public health and clinical practices are selected and discussed in this paper.

Methods

A search was performed on MEDLINE, CINAHL, and Scopus databases using the keywords 'health' AND 'behaviour' AND 'model' OR 'theory', from the start date of each database to January 2020. In addition, Google and Google Scholar were searched. Finally, in framing the structure of a research project in public health and clinical practices, commonly used theories and models of health behaviour are included and discussed. To identify theories and models commonly used to underpin research projects in public health and clinical practices, existing evidence including systematic reviews and meta-analyses, describing a particular theory or model, were reviewed.

Biomedical model

The biomedical model relies on the notion of disease (Havelka et al., 2009), which is characterised by its sequence of *aetiology to pathology to manifestation.* The assumption behind this model is that every disease has a specific causal factor that physically affects the human body. This factor may be internal (vascular, immunological, and metabolic) or external (physical, chemical, and microbiological) in origin. The biomedical model views disease as a separate entity (i.e., independent of the individual affected), and therefore an individual involved is assumed to *undergo* medical procedures, such as surgery, radiology, and pharmacology, which physicians will manage in their entirety (Havelka et al., 2009). This means that the biomedical model emphasises the pathology of the disease and generally does not consider personal and other factors that may influence its severity, outcome, treatment, or prevention.

With these notions, the biomedical model helped to enhance the understanding of disease or illness and useful treatment (Havelka et al., 2009), particularly at a time when acute infectious diseases caused by a single agent were the foremost health concern. Nowadays, the view is that disease causation is multifactorial, including individual, social, and environmental factors (Parascandola, 2011). In view of the complexity of health and disease, the biomedical model has been criticised by scholars from a range of disciplines for ignoring the broader social and psychological factors that may affect health behaviour (Deacon, 2013; Havelka et al., 2009). The narrow approach of the biomedical model is exclusively organ-oriented and has little to offer prevention and control programs that may play a substantial role in reducing the occurrence of chronic diseases by changing factors such as health beliefs, attitudes, and behaviours (Havelka et al., 2009). In contrast to the approach suggested by the biomedical model, individuals with a health condition should be enabled to become more actively involved in the management of their health (Stamm et al., 2014).

Biopsychosocial model

The biopsychosocial model evolved from the biomedical model by considering disease or illness to be a complex outcome of biological, psychological, social, and cultural factors (Gatchel and Turk, 2008). These factors may operate to ease, worsen, or otherwise alter the course of diseases, though their significance differs from disease to disease, from one person to another, and even between two different episodes of the same disease in one person (Fava and Sonino, 2008). With this perspective,

Engel (1977), the originator of the biopsychosocial model, attempted to offer an understanding of disease and its determinant factors, particularly those medical conditions for which the biomedical model is not a good fit (Green and Johnson, 2013). The principal contribution of the biopsychosocial model to medical healthcare is that the social dimension has been shifted from the patient context to the role of the healthcare system itself in causing and relieving disease (Álvarez et al., 2012). This model has also gained extensive acceptance in guiding the provision of healthcare for various conditions (Álvarez et al., 2012). There is evidence that the biopsychosocial model has made a considerable improvement in the way that chronic pain care for instance is provided (Weiner, 2008). It is the biopsychosocial model that has led to the emergence of an effective multidisciplinary approach to the management of chronic pain (Gatchel and Turk, 2008). In addition, a systematic review of the literature has demonstrated that the biopsychosocial model is effective for the optimal management of chronic diseases in primary care (Kusnanto et al., 2018).

Despite its wide application in epidemiological studies and the clinical care of various health issues, the biopsychosocial model has limitations (Pilgrim, 2015; Weiner, 2008). For example, there is a concern that because the biopsychosocial concept was developed as a way of approaching disease with a more humanistic and holistic view than had been customary, it was not intended to account for the limitations of all other theories or models of health, and it was simply an alternative means to understand the interplay between variables that influence population health (Weiner, 2008). A variable is defined as 'an empirical phenomenon that takes on different values or intensities' (Flannelly et al., 2014: 162). Moreover, Smith et al. (2013) argued that the biopsychosocial model is not definable and therefore not testable as we presently use it. This model also fails to answer the essential question of how the biological, psychological, and social variables interact in the manifestation of the disease (Weiner, 2008).

Social cognitive theory (SCT)

SCT evolved from learning theory and focusses on reciprocal determinism, the dynamic interplay between humans and their environments (Bandura, 2004). Unlike most behavioural and social theories, which emphasise the personal, social, and environmental factors that govern human behaviour, SCT hypothesises that human behaviour is an artefact of the dynamic interaction of individual, behavioural, and environmental factors (McAlister et al., 2008). According to this theory, human motivation and action are broadly determined by three expectancies: situation-outcome, action-outcome, and perceived self-efficacy (Luszczynska and Schwarzer, 2005). Outcome expectations (situation-outcome and action-outcome) are 'beliefs about the likelihood of various outcomes that might result from the behaviours that a person might choose to perform, and the perceived value of those outcomes' (McAlister et al., 2008: 172). For example, the belief that consulting a healthcare provider and taking the course(s) of action recommended for a disease will lead to recovery from the disease would be an action-outcome expectancy. Perceived self-efficacy expectancy, which is an individual's beliefs about his/her capability to execute a particular action required to achieve the desired outcome is the other key construct of SCT (Luszczynska and Schwarzer, 2005). Taking an individual with Chronic Obstructive Pulmonary Disease (COPD) as an example, perceived self-efficacy expectancy can be described as the individual's beliefs about his/her skill or ability to seek the required treatments to lower the chance of complications and associated consequences (Main et al., 2010).

Bandura proposed that in addition to the knowledge of health risks and benefits, self-efficacy is necessary for behaviour change to occur. According to Bandura, self-efficacy is the central construct because it affects behaviour directly, and indirectly, by influencing goals, outcome expectations, as

well as barriers and facilitators (Bandura, 2004). Several primary studies (Janicke and Finney, 2003; Rogers et al., 2005), systematic reviews and meta-analyses (Plotnikoff et al., 2013; Stacey et al., 2015; Young et al., 2014) have been undertaken using SCT. These studies provide evidence that SCT is comprehensive in addressing a range of factors affecting health behaviours, such as healthcare utilisation, physical activity, and nutrition. However, this theory is not without criticism. For example, McAlister et al. (2008) criticised that SCT is so broad that it has not been tested comprehensively, unlike other health behaviour theories.

Theory of planned behaviour (TPB)

The TPB is an extension of the theory of reasoned action (Montaño and Kasprzyk, 2008), and emphasises the theoretical concept that individual motivational factors regulate the likelihood of behaving in a particular way (Ajzen, 1991). This theory relies on the underlying assumption that the most important predictors of a particular behaviour, when the individual does not have full control over that behaviour, are the intention to perform the behaviour and perceived behavioural control (Montaño and Kasprzyk, 2008; Rise et al., 2010). Moreover, the TPB posits that intention to perform the behaviour is a function of three factors (Casper, 2007):

1. Attitude toward the behaviour – refers to beliefs regarding the outcomes of performing a specific behaviour;
2. Subjective norm – refers to perceived social pressure to perform or not perform the behaviour; and
3. Perceived behavioural control – refers to perception about the extent to which the behaviour is within the individual's control, measured in terms of his or her capability or skill and opportunity about performing the behaviour.

The TPB has been used successfully to predict and explain a range of health-related and social behaviours, including healthcare seeking and screening programs (Luzzi and Spencer, 2008; Mo and Mak, 2009; Sniehotta et al., 2014). Further, a meta-analysis study that evaluated the suitability of the TPB provides evidence that the theory is an effective framework for predicting screening intentions and attendance (Cooke and French, 2008). However, critics have noted that the TPB exclusively emphasises rational reasoning (for example, from knowledge about the significance of seeking treatment for COPD to decision to start seeking treatment), and excludes unconscious influences on health behaviour (Sheeran et al., 2013) and the role of emotions beyond anticipated affective outcomes (Conner et al., 2013). According to Sheeran et al. (2013), modifying conscious cognition, such as behavioural intentions and risk perceptions, does not result in seeking treatment for COPD and adherence to the recommended course(s) of action, mainly due to the influence of non-conscious or implicit processes. This limitation is not only restricted to the TPB, but it also applies to most theories and models of health behaviour. In addition, a meta-analysis study by McEachan et al. (2011), which attempted to predict health-related behaviours with the TPB criticised the theory for its static explanatory nature which does not assist in understanding the influences of behaviour on cognition and future behaviour.

Ecological model

McLaren and Hawe (2005: 9) defined the ecological model as 'a conceptual framework designed to draw attention to individual and environmental determinants of behaviour. The visual metaphor is a

series of concentric or nested circles which represents a level of influence on behaviour'. This model of health behaviour integrates social and psychological factors and gives attention to environmental and policy perspectives on behaviour. The model is tailored to consider multiple levels of factors that are constantly interacting to affect health behaviour (Glass and McAtee, 2006). According to Sallis et al. (2008: 466), the four core principles of the ecological perspective model of health behaviour are that:

1. *There are multiple influences on specific health behaviours, including factors at the intrapersonal, interpersonal, organizational, community, and public policy levels;*
2. *Influences on behaviours interact across these different levels;*
3. *Ecological model should be behaviour-specific, identifying the most relevant potential influences at each level; and*
4. *Multi-level interventions should be most effective in changing behaviour.*

The main strength of the ecological model is that it is unique in considering that multiple levels of factors affect health behaviour, which expands opportunities for appropriate interventions (Sallis et al., 2008). In contrast to those models focussing merely on individual factors, the ecological model's perspective holds that policy and environmental modifications influence practically the whole population. Based on the ecological model, scholars have argued that the potential factors affecting health behaviour within a population are contemplated within the social context, which can include family, friends, neighbourhoods, and formal and informal organisations such as health institutions (Stokols, 1996). Thus, the model concludes that it takes both personal-level and environmental or policy-level factors to achieve a comprehensive understanding of the diverse groups of correlates of health behaviour (Sallis et al., 2008).

Although the ecological model of health behaviour is more comprehensive, critics have identified the following four limitations:

1. Due to its complexity, the model lacks specificity about the most significant posited influencing factors, which places a greater challenge on health professionals to determine critical factors for each health behaviour (Livingood et al., 2011; Sallis et al., 2008);
2. Even in the case of the behaviour-specific ecological model, there is a lack of information about the dynamic interactions of variables across the different levels. Thus, the ecological model broadened its perspective without specifying variables or presenting guidance about how to use the model to enhance research (Livingood et al., 2011; Sallis et al., 2008);
3. The ecological model makes it difficult to formulate testable hypotheses and is demanding to manipulate experimentally. Therefore, it is difficult to operationalise (Korin, 2016); and
4. As Green et al. (1996: 273) argued:

> *If the ecological credo of everything influences everything else is carried out to its logical extreme, the average health practitioner has little basis on which to set priorities and has good reason to do nothing because the potential influence of or consequences on other parts of an ecological system are beyond comprehension, much less control.*

Health belief model (HBM)

The HBM is one of the oldest and most frequently used theoretical models to explain health behaviour (Rosenstock, 2005). It was first designed in the 1950s to describe why people do and do

not adopt disease prevention programs or screening strategies for early detection of disease and has been modified subsequently. The HBM argues that health behaviour can best be understood if people's beliefs or perceptions about health are known. Accordingly, an individual's belief about the threat of a disease or health problem, along with his/her belief in the effectiveness of the recommended course of action/health behaviour, will determine the probability that he/she will adopt the behaviour (Nutbeam et al., 2010; Strecher and Rosenstock, 1997). The key elements, including perceived seriousness, susceptibility, benefits, and barriers comprise the model. The model also incorporates cues to action, modifying factors, and self-efficacy to expand the scope of its application further (Strecher and Rosenstock, 1997).

Strecher and Rosenstock (1997) defined the key constructs of the HBM as follows:

1. Perceived susceptibility – an individual's belief about his/her chance of getting the problem/disease;
2. Perceived seriousness – an individual's belief about how severe the disease and its consequences are;
3. Perceived benefits – an individual's belief as to whether the recommended action reduces the threat or severity of the impact;
4. Perceived barriers – an individual's belief about what could prevent him/her from undertaking the recommended action;
5. Modifying factors – personal factors that influence the adoption of new behaviour;
6. Cues to action – factors that activate the person towards adopting the new behaviour; and
7. Self-efficacy: An individual's confidence in his/her ability to take action.

These concerns are further influenced by other factors such as past experiences, culture, and sociodemographic factors, which are called modifying factors in general (Strecher and Rosenstock, 1997). In addition, cues to action, which may be events, people, or anything that triggers people to adopt a new behaviour, are an important concept in the HBM (Abraham and Sheeran, 2005).

In general, according to the HBM, modifying factors, cues to action, and self-efficacy influence individuals' perceptions of susceptibility, seriousness, benefits, and barriers, and thus their adoption of new health behaviour. Despite it having been used in a wide range of studies exploring various health behaviours, critics have identified the following limitations. Firstly, the model fails to indicate the significance of intention formation, or the influence that others' approval may have upon people's behaviour (Abraham and Sheeran, 2015). Secondly, the relationship between risk and severity combining to inform a sense of threat is not explicitly defined (Champion and Skinner, 2008).

Behavioural model of health services utilisation (BMHSU)

The medical sociologist Andersen (1968) developed the BMHSU, which has come to be widely used to study utilisation and access of services. The model was originally designed to improve understanding of why families use health services, to explain and measure equitable access to healthcare, and to assist in developing policies leading to equitable access. According to this model, health services utilisation is a function of three main factors, namely predisposing, enabling, and need factors (Andersen, 1968; Jahangir et al., 2012). Predisposing factors include demographic variables, social structure, and health belief, while factors such as income, regular source of care, health insurance, and travelling and waiting times are enabling factors (Andersen, 1968). Need factors include an individual's perceived healthcare needs (for example, self-perceived health, self-

reported number of symptoms, restricted activity, number of bed days, and activities of daily living) and other indicators of their health status (Jahangir et al., 2012).

Andersen's initial BMHSU has its limitations, such as lack of adequate consideration of organisational factors as enabling factors (Gilbert et al., 1993; Patrick et al., 1988), and its failure to account for the extent and quality of social relationships (Pescosolido, 1992) in predicting health services utilisation behaviour. In response to these limitations, and to enhance its applicability further for exploring health services use and access, Andersen revised the model in 1995. According to the updated version, health services use and health status are influenced by several factors, in addition to those in the original version, environmental factors, which include factors related to the healthcare system, and other environmental characteristics are added as predictors of health services utilisation. Thus, the conceptual framework of Andersen's BMHSU employs a system perspective to integrate an array of factors influencing the decision to seek healthcare.

Andersen's model has been used in a wide range of studies investigating health services utilisation behaviours of people with varied health problems (Brown et al., 2009; Dhingra et al., 2010; Han-Kyoul and Munjae, 2016; Salinas et al., 2010), suggesting that the model is effective in predicting health-related behaviours. A systematic review of studies conducted using Andersen's model as their theoretical framework also demonstrated that there are hundreds of primary studies that have effectively applied the model (Babitsch et al., 2012).

Conclusions

Each theory and model of health behaviour has its strengths and weaknesses, and each contributes to our understanding of reality in different ways. For example, the HBM, which emphasises individuals' perception, attitude, and belief, best suits studies that merely seek to investigate individual characteristics that influence health behaviour. However, unlike the HBM and biomedical model, most health issues, are complex, caused by multiple factors, personal, sociocultural, and environmental. In such cases, the biopsychosocial model, ecological model, and Andersen's behavioural model are important in examining those wide arrays of factors that influence health behaviour. The selection of a theory or theories that have the best fit to a particular research project must therefore be preceded by the clear justification that the chosen theory fits the research questions, the structure of the research, and the research design (Grant and Osanloo, 2014).

Key points for policy, practice and/or research

- Theory is a tool for a better understanding of reality.
- In quantitative research, theory is a blueprint for a research project.
- Health research established in theory enhances knowledge and provides a strong evidence for clinical and public health practices.
- Each theory and model of health behaviour has its strengths and weaknesses, and each contributes to our understanding of reality in different ways.
- Linking the theoretical framework of a research project to established and comprehensive theories and/or models is about justifying that these theories and/or models fit the research questions, the structure of the research, and the research design. This is to ensure a valid and reliable study is produced.

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