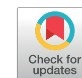
Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Research article

Developing a decision-making dependency (DMD) model for nurse managers



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ARTICLE INFO

Keywords:
Health sciences
Nursing
Social sciences
Management
Human resource management
Nurse managers
Decision making
Management
Dependency factors

ABSTRACT

Decision making is an inherent, complex and vital component of the work of managers. Its importance and role in operationalizing the activities of an organisation are well-evidenced in management literature. Yet, there is a dearth of literature about the processes used by nurse managers to make decisions. The principal aim of this paper is to identify the different types of decisions made by nurse managers and explore the related decision-making processes. A 'dependency model' is proposed, which illustrates the factors affecting the art of decision making. Structured interviews were conducted to identify types of decisions made by nurse managers in different health-care settings and the factors underpinning these decisions. The research focused on an intensive study of a small group of nurse managers working in rural and regional health institutions in South Australia. The sample included nurse unit managers, after-hours coordinators and directors of nursing. Hermeneutic principles and interpretive research were used to conduct interviews with nurse managers who make numerous and varied types of decisions, though often without following a step-by-step approach. The study identified dependency factors that influence how decisions are made, and developed a model based on eight key variables: (1) the situation to be addressed; (2) the time period in which the decision has to be made; (3) required inputs from colleagues; (4) complexity of the task and the environment, (5) the duration and time it takes to make a decision, (6) availability of resources, (7) the decision-making environment, and (8) personal characteristics. These eight variables are interrelated and have both direct and indirect impacts on how decisions are made. Nurse managers make pragmatic decisions reflecting the complexity of their roles and responsibilities. Awareness of the factors on which decisions depend helps understanding of how they navigate through decision-making processes. The findings are presented as a model that can be used to support decision making by nurse managers in various health settings.

1. Introduction

1.1. Decision-making

Decisions are made at different levels in an organisation involving single individuals or groups. This complex cognitive human activity has small-scale impacts, applying to an individual, or they can affect the operation of a large corporation, a community or wider society (Goodwin and Wright, 2014). The consequential impact can also have limiting or progressive effects, and temporary or permanent impacts on individuals, organisations, groups and communities. Decision making is multi-faceted to the extent that there are numerous factors that influence how decisions are made (Ford and Gioia, 2000; Wu et al., 2016). Decision making is a vital component of human and management activity, yet its processes are often obscured and not easily explained. Knowing which factors can mitigate the process of decision making is vital to expediating decision-making processes. More importantly, knowing which factors need to be considered when making decisions is pivotal to the overall process of decision making.

When making a decision, there is a conscious choice to behave or to think in a certain way. It entails reaching a conclusion and making a choice or selection of the best alternative from a set of possibilities of a group of two or more possibilities (Al-Tarawneh, 2012; Jonassen, 2005; Nibbelink and Brewer, 2018) to solve a problem according to the demands of the situation (van Knippenberg et al., 2015) and the opportunities that exist (Hunink et al., 2014). Hence, Tannenbaum (1950 p. 23)

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https://doi.org/10.1016/j.heliyon.2019.e03128
Received 5 June 2019; Received in revised form 5 November 2019; Accepted 23 December 2019
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states that “to decide” means “to cut off”, meaning that a decision implies taking one course of action from a set of alternatives. Decision making also involves undertaking a series of steps that often begins with an identified stimulus, a need or a thought, and results in a commitment to action (Goetsch and Davis, 2014; Simon, 1977). It is a sequence of activities that involves gathering, interpreting and exchanging information, creating and identifying alternative courses of action, and then choosing among alternatives (Thompson, 2018, p.166). In summary, a decision is a conclusion arrived at after careful consideration of the alternatives; it is the final product of a specific mental and cognitive process of an individual's choice leading to the selection of a course of action (Kennerley and Mason, 2008, p.7).

The complex processes involved in decision making are not always readily understood (Bojadziev and Bojadziev, 2014). This may be especially so in the health sector, where technological advances are driving changes to policy and regulations while making new demands on the workforce. Arguably, even though decision making has been extensively discussed in management literature, arguably, the *process* of decision making remains quite difficult to determine and understand, and with little critical focus in health-care institutions (Hunink et al., 2014; Saaty and Vargas, 2013). This is surprising given that decison making is a vital activity having both direct and indirect impacts on patient well-being.

Nurse managers, who occupy the role of middle-level management within the health system (McSherry et al., 2012; Merrill, 2015; Skytt et al., 2008), make decisions that impact on care providers' activities within clinical and critical-care settings (Majid et al., 2011; Standing, 2014). Decision making by nurse managers is one component of a complex, multi-responsibility position, which demands execution of varied decisions to address the variety of situations in the clinical area. These decisions can be simple or complex (Lake, 2007), often with major impacts on patient care and helping to shape how hospitals and other health-care facilities function (Thompson and Yang, 2009). The abilities of managers to develop good decisions may be affected by various impacting personal and situational factors, including policy standards, knowledge, skills, protocols and the heath-care environment (Ejimabo, 2015).

Within the health sector, decision-making processes present a major challenge. To ensure that institutions meet their prime care-provision outcomes, there is an increasingly recognized need for the development of improved approaches to aid decision making within the sector, including by nurse managers (Reid and Weller, 2010). It is therefore important to understand more about the process of decision making, including factors affecting how decisions are made. In this paper we refer to these as dependency factors and we examine how nurse managers make decisions, drawing upon interviews and close observation of a small sample of nurse managers in South Australia. Dependency factors emerge from this analysis and are combined in a simple conceptual decision-making dependency (DMD) model, which we suggest can be used to help formulate better decisions and as part of nurse-mangers' training to recognise the principal variables affecting their key decisions.

1.2. Management and decision making

In any organisation, managers oversee day-to-day operations and manage organisational affairs by directing activities through management processes of recruitment, selection, job description, organising, planning, training, marketing, and policy application that permeate through managerial activities (Schermerhorn et al., 2014). Without managers the organisation's activities would be chaotic. Organisations therefore need managers to steer their activities through challenges and uncertainties, and to provide direction and meaning to their activities. Management is a series of decision-making processes, with decision making located at the heart of executive activity (Anderson et al., 2015). It is a practice that blends a good deal of craft (experience) with a certain amount of art (insight) and some science (analysis) (Mintzberg, 2003, p.1).

Effective management requires managers to develop strong decision-making abilities by applying good judgement and having an insight to any given situation because what ever a manager does, s/he does through making decisions (Bloom et al., 2012; Weiss et al., 2019). Thus, ‘good’ decision making is the fundamental hallmark of a professional manager's skills, functioning and effectiveness (Lunenburg, 2011). Good judgement and insight underlie the decision-making process (Bouyssou et al., 2013). To be good decision makers, managers should have critical thinking skills and be able to respond quickly to situations. They must also reflect and identify areas needing improvement (Liebler and McConnell, 2016).

Successful outcomes from decisions taken depend largely on the fine balance between the manager making the decisions and the environment in which a decision is made. Good knowledge of a given situation by a manager acts as a platform for the decision-making process and offers a position from which to defend actions taken. In general, decision making, among other qualities and functions of a manager, presents ongoing demands. In this regard, a manager must have the necessary tools and processes to allow them to make good decisions and solve problems (Beck and Harter, 2014). This is especially true in situations where decisions may have major consequences for human health and well-being, as is the case in the health-care sector.

1.3. Decision making within the health-care sector

Health-care institutions are dynamic, challenging, complex in nature, and established to save lives and improve the wellbeing of patients. Managing such an environment is a difficult, nuanced business, which requires various tacit understandings that can only be gained in context (Mintzberg, 2003). Decision making within the health sector is undeniably becoming more complex, because of the ever-changing trends, policies and increased technological advances in medicine underpinned by increases in patients' knowledge and awareness of their rights. This all adds to growing complexity regarding how measures that support delivery of care should be structured and delivered (Effken et al., 2010; Huston, 2008; Santana et al., 2018).

High quality, sound decision making is one of the major elements and essence of good management and leadership in health-care institutions (Bender, 2016). Decisions impacting on life and the wellbeing of patients have a different type of weight attached to them as compared with the types of decisions made in other fields and organisations. The ultimate intention of a decision in a health-care context is to maximize outcomes to patients by way of effective service provision that delivers positive results. In addition, decisions in health-care settings must be made in a way that is consistent with professional expectations and demands made by the medical profession. These decisions can be ethically and morally challenging because they directly and indirectly involve human life and wellbeing. Undoubtedly, decisions made in the clinical environment contribute significantly to the patients' experience as well as enabling the efficient, effective and efficacious use of finite human resources to meet care demand and improve service delivery. The consequences of poor or inefficient decision-making processes can easily be manifested by decisions that are ineffective and consequently adversely affect performance and care delivery.

2. Materials and methods

2.1. Research approach

The researchers employed a qualitative phenomenological approach using hermeneutics to investigate the subjective perspective of individuals' (nurse managers') experiences (Balls, 2009). Hermeneutics describes and interprets human experience, “seeks meanings that are embedded in everyday occurrences” (Reiners, 2012, p.1) and draws upon prior knowledge of situations encountered by the subjects. Hence, based on the hermeneutic interpretive process developed by Heidegger (Mackey, 2005; Miles et al., 2013; Reiners, 2012), the researchers sought

to understand the world of nurse managers and draw meaning from narrative accounts they provided (Holloway and Galvin, 2016; Wang and Geale, 2015). The aim was to describe the nurse managers' experiences and their influence on individuals' decision making. This approach required examining, reflecting, analysing and interpreting 'texts' (the experiences) to discover their meaning regarding decision making (Sloan and Bowe, 2014). Permission to conduct the study was obtained from the Human Research Ethics Committee, University of South Australia.

The research took place in rural and regional health-care facilities in South Australia. While the findings can be applied broadly to facilities elsewhere, including those in urban and metropolitan settings, it should be noted that specific demands are often placed upon health-care staff working in rural and regional areas. For example, different skills and role expectations may exist between workers in regional and metropolitan settings in essentially similar positions. Managers in regional areas practice in an environment often affected by diminished human and material resources compared with their urban counterparts (Mlcek, 2005). The under-supply of health professionals in regional Australia has resulted in less health expenditure than with fee-for-service funding arrangements. This reflects the distinctive social, economic and demographic characteristics of rural areas that contribute to lack of support and networking due to physical and professional distance from other peers (Bourke et al., 2012).

2.2. Sampling

This paper describes part of a broader investigation of the role of nurse mangers in rural and regional health-care facilities in South Australia (Chisengantambu, 2015; Chisengantambu et al., 2017). Mixed method sampling was used to obtain rich data (Palinkas et al., 2015). Simple random sampling gave every regional and rural health institution in the state an equal chance to be involved in the study, selecting randomly from the eight regions of South Australia and a list of the hospitals and health-care facilities in each region. Letters were sent to health institutions requesting their participation in the research and stating the study aims and purpose. Having selected facilities, purposive sampling (Robinson, 1998, p.29) was then used to select individual nurse managers who occupied a range of different nurse manager positions, including nurse unit managers (NUM), after-hours coordinators (AHC), residential care managers (RCM), clinical nurse consultants (CNC) and directors of nursing (DON). This meant that the sample composition included nurse managers working in different capacities and types of facilities, which provided diverse experiences and world-views. Informed consent was obtained from participants, who could ask questions and clarify points that were unclear. Participants were assured of confidentiality, with pseudonyms used in this account to guarantee anonymity.

2.3. Data collection and analysis

Data were collected using a mixed approach, consisting of face-to-face interviews, direct participant observations by the first author, and review of documents. This approach ensured that the collected data captured the detailed, rich and complex experiences of the participants, enabling clearer understanding of what and how decision making occurred in the various health settings.

Interviews were conducted with nurse managers using a semi-structured data collecting tool, comprising mainly open-ended, semi-structured and contrasting questions to elicit opinions and perceptions of nurse managers. As per the Heideggerian approach, participants were encouraged to engage and to self-reflect during the process of data collection in order to help elaborate and explain their experiences. Interviews were recorded with the participants' permission and transcribed for analysis. Although interviews are the focus of this paper, the findings also reflect observation of the interviewees in the workplace by the lead author and consideration of management documents.

Data were analysed using a data management tool, NVivo qualitative software, employing a coding system from which it is possible to create reports, queries and charts. Themes and patterns were identified in the data, providing new insights into nurses' experiences (Hila and Alabri, 2013) by using the software to recognise themes linked to the textual descriptions of the participants' experiences. This helped identify views and feelings associated with the experiences of decision making. Four processes were used when analysing data:

a) organisation (achieved through coding);
b) summarisation and categorising;
c) identification of patterns and themes; and
d) linking themes and drawing a relationship between themes and ideas.

Use of NVivo as a method of data management in this fashion is endorsed by King (2004, p. 263) who argues that it is invaluable in helping to index segments of text to particular themes, to link research notes to coding, and to perform complex search and retrieve operations, which can aid the researcher in examining possible relationships between the themes.

Using NVivo, inductive analysis was applied to derive concepts and themes, through interpretations made from the transcribed data, thereby allowing theory to emerge from the data rather than starting with theory and endeavouring to test hypotheses (Thomas, 2006). During the process of data interpretation, quotes were used to highlight the views being expressed. Data saturation was reached when no new themes or new thematic information were being attained or adding to the overall experiences of the nurses. This occurred with a sample size of fifteen: 14 women and one man.

3. Results

3.1. Types of decision made

Decisions vary in relation to their scope, purpose, the nature of their inputs and outcomes, and by virtue of their specific requirements, procedure or structure. Exploring how decisions are made helps to elucidate the time spent on decision making and the role and type of activities carried out, which in turn impacts how decisions are made. For example, one participant said "80–90% of the time the situation dictates to us what we should do and what type of decision we have to make" (Molly). Deducing from the participants' responses, the researchers identified the following categories of decisions the nurse managers made:

- Sporadic and unplanned decisions: These were made 'on the spot' without much planning;
- Planned decisions: These had been thought through and careful consideration had been given to their implementation;
- Information-supported decisions: Decisions that were made after certain information had been clarified with colleagues or senior managers, e.g., information concerning the purchase of equipment;
- Participative decisions: Decisions that were made collectively, i.e. through a meeting or networking groups. These are also consultative in nature with other people being consulted before a decision is made;
- Formal and bureaucratic management decisions: Decisions made at executive level and handed down to subordinates (including nurse managers) by senior management. These types of decisions are usually non-negotiable, and the staff must abide by them.

The nurse mangers also recognized that the types of decisions made in health-care facilities are influenced by the level at which the decisions are made. Hence, they distinguished between executive, managerial and clinical decisions, as indicated in Figure 1.

The responses obtained in interviews revealed that decision making by the nurse managers was neither streamlined nor confined to specific rationalized processes; that is, no pre-determined or set processes were

Figure 1. Types of decision made in health-care facilities.

followed when making decisions. Indeed, the nurses found it difficult to clearly articulate how they made decisions, especially as this varied with each situation. For instance, some decisions were well-planned and well-executed while some decisions were made 'on the spot' and 'on the run'. Answers to the question, "How do you make decisions?" were varied, consistent with the complex nature of decision making. One nurse queried, "How are we supposed to make decisions? We make decisions like anybody else. I make a decision as I would make a decision at home; but the scenario and the situation at work are different to that at home" (Cathy).

Only some of the participants followed a recognisable decision-making pattern, as shown by the quotes presented in Table 1. Responses to the question about how nurse managers made decisions included phrases such as 'normal', 'nothing particular', 'like anybody else', 'chaotic at times', 'confusing', 'not sure', 'lack of clarity', 'the blind leading the blind', 'we have to do what we have to do', 'we do not usually have a choice' and 'we have to oblige to the situation'.

Table 1. Decision-making: Quotes from nurse managers.

"I would not say there is a system or a pattern, but I would say that I tend to use some strategies more commonly than others" (Sue).
"There is a system which I have developed but it is hard to put this into words" (Daisy).
"The nature of the situations determines how the decision is made" (Jaylee).
"We do everything to make sure that the care of the patient is not compromised. They say the customer is always right and in this case the patient is always right. I do not necessarily have to agree with what they are saying, but I have to be professional about it and how I handle the situation. I also use the same strategy with the staff when they sometimes make demands that are not possible at the time" (Theresa).
"The nature of the situation influenced how the decision was made. In some situations, you may have time to consult other people, but when it comes to a patient's condition, sometimes you just have to make a solo decision, especially when you work at night and there are no other senior nurses around" (Danny).
"There is no clear-cut procedure that I use, but I guess I follow the usual process of referring to policies and procedure manuals, consulting with other staff, nurse managers and my supervisors" (Sue).
"Most of the time, I think the idea through in my head and then implement the idea and if there is time, I can ring other people. There are times when you are thinking on your feet and you go ahead and implement the idea, then after you implement the idea you say, 'whoops!' I wish I had consulted other people first" (Cassie)

Source: First author's interviews with sample nurse managers.

Nurse managers tended to use a "search and find" approach to look for relevant information, clues or ideas before making a decision. However, when participants were asked to elucidate the process they used when making decisions, they responded as shown in Table 2.

3.2. Executive decisions

At the selected health facilities, executive decisions were typically strategic in nature. Within the clinical setting, the executive usually consisted of the Director of Nursing (DON), Director of Allied Health, Medical Director, Director of Financial and Human Services, the Chief Executive Officer (CEO) and a community representative. Executive decisions are often wide-ranging and long-term, consisting of deliberate and planned decisions that affect the operational processes of the whole organisation. For instance, they are concerned with issues such as preparing a hospital for accreditation, recruitment and retention of employees and ensuring the safety of the whole organisation. A sample of the participants' views of executive decision-making is shown in Table 3.

According to one of the interviewees (Theresa), there is a thin line between being a nurse manager and being part of the executive. With the exception of the DON, who is part of the executive, she regarded other nurse managers as managers at an operational level. She observed, "The difference between the executive and the nurse manager is that the executive deals more with the administrative issues, paper work, or nowadays more with the computer, a lot of thinking through work, as compared with being on the floor, which applies to the clinical nurse manager."

Deducing from the data collected, we identified executive decisions to be characterised by four key components, namely:

- general - affecting the whole organisation;
- strategic - providing direction to the organisation as a whole and generally well-planned and thought through decisions;
- directive - directing the activities undertaken by people within the organisation; these types of decisions are largely unquestioned; and
- control - providing order to the organisation.

3.3. Managerial decisions

Managerial decisions are commonly referred to as 'operational decisions', which deal with day-to-day management issues within the organisation and particular sub-units (such as a ward). Such decisions involve choosing options directed towards resolving organisational problems and achievement of organisational goals (Kerrigan, 1991). Within health-care settings, managerial goals are directed toward providing optimal patient care and minimising costs, that is, balancing quality and efficiency (Effken et al., 2010). The managerial activities in this study relate to these goals and are often concerned with nurse managers liaising and coordinating activities between the executive and general staff.

The participants' views of managerial decisions are reflected in the comments shown in Table 4. Managers are expected to obtain, interpret and apply regulations and policies that underpin practice. For instance,

Table 2. The decision-making process as identified by nurse managers.

"Get the facts first, do your research and verify the facts, and determine the problem(s)" (Cathy); "Consult other health care professionals and identify alternatives and options" (Danny); "Weigh the pros and cons of the situation and the decision to be implemented" (Sue);
"Implement the decision" (Cassie);
"Figure it out yourself at the individual level" (Daisy); "Confirm, validate and act – use evidence and other supporting factors i.e. protocols and procedures before a decision is made" (Jaylee); "Evaluate the outcome which involves critically thinking through and analysing the outcome" Molly).

Source: First author's interviews with sample nurse managers.

Table 3. Executive decisions: Views from nurse managers.

"I see the executive as being at a higher level of decision making than what my current role is" (Danny). "The executive is definitely more around sorting out responsibility of high-level management such as safety issues" (Robyn). "I see those more of the upper level decision-making, from the budgetary point of view, and [they] are responsible for making decisions such as whether we are going to shut down beds and that kind of level of action and planning" (Molly).

Source: First author's interviews with sample nurse managers.

Table 4. Managerial decisions: Views of nurse managers.

"As managers, we are dealing with multitudes of things, not only clinical or professional. We are also dealing with human relation issues and all sorts of things" (Leslie). "Managerial decision making is probably more of the management of stock resources and probably involves more of our Director of Nursing" (Cathy). "Managerial decisions I think probably include some of the tougher decisions" (Leslie). "I think in general, managerial decisions are decisions I make by myself perhaps discussed with hospital people or whoever; and I would say they are more in relation with the running of the ward as opposed to the clinical work of patients or handling of the patients" (Mary).

Source: First author's interviews with sample nurse managers.

nurses were seen to action and review different policies, such as patient transfer and infection control.

3.4. Clinical decisions

In this paper clinical decisions are defined as those concerned with clinical services and with provision of care. Activities involving the participating nurse managers included providing hands-on care, supporting other staff to provide care to patients and taking responsibility for directing care activities. The clinical role also involves movement of staff and patients within a facility or between facilities to maximise the provision of desired care. For example, Molly said, "I think your clinical decisions are different from the management decisions because at the end of the clinical decision, it is somebody's life that you are dealing with while with the management decisions there are no end of life decisions." Robyn added that, "Good decisions at the clinical level are those that have a good or positive outcome, decisions that work out better for the patient and their families. They are clinical focused because they are directly and indirectly related to patient outcomes."

The overall goal of clinical decisions is to ensure good patient outcomes, which is determined by the type of care provided. Both clinical and management practice decisions are designed to support and ensure good patient outcomes. A statement from Molly summarises the pragmatic nature of the decision-making: "We as nurses, … find a problem and find solutions and you just do it. So, I think we are very creative at finding solutions and sometimes you cannot find those solutions in the textbook."

The interviewees highlighted the fact that clinical decisions represented only one aspect of their job. Collectively they spent 60% of their time on managerial activities and 40% on clinical issues. Other studies have revealed that nurse managers in general spend 25% of their time on what they feel is most important and 75% on other duties and obligations (Baker et al., 2012). Interviewees felt that nurse managers play a myriad of roles and these roles vary from simple to complex, and from clinically orientated to community-focused decisions. They regarded the multiplicity of roles as adding to the complexity of the job. Balancing multiple roles affected their functionality and increased the complexity of the activities and responsibilities in which they engaged. In turn, this affected what, when and how decisions were made. However, our findings are in broad agreement with those of Krishnan (2018) that the cognitive processes used in decision making were neither completely analytical nor completely intuitive (though see Payne, 2015).

The multiplicity of roles subjects nurse managers to competing pressures to effectively control and manage the clinical environment and to ensure conformity with organisational and professional expectations (Cooper et al., 2019). Arguably, role multiplicity demands that the nurses take on wide-ranging responsibilities to meet a growing number of organisational demands and expectations, which in turn impacts on decision making.

4. Discussion

4.1. Key influences on the decisions of nurse managers

Decision making was observed to be influenced by various needs, problems and situations. Some of the prime factors influencing the way in which decisions were made included:

- How is the problem presented?
- What type of problem is presented?
- Who has presented the problem? (is it the clinical staff, the patient or another health professional? Is it a policy or clinical issue?)
- Why is a decision required?
- How quickly does the decision need to be made?
- Does the decision need to be made in isolation or does it need to involve other people?
- Is it possible to largely foresee the anticipated outcome?
- Can the positive and negative effects of the decision be articulated?

Essentially, these eight questions can be simplified into the who, when, why, where and how (the 4Ws and 1H) of decision making, summarised as:

- Who needs to make the decision?
- When does the decision need to be made?
- Why does the decision need to be made?
- Where does the decision need to be made (this may relate to a specific area of the organisation)?
- How will the decision be made? (including whether processes need to be reviewed before the decision is made?)

All decisions are taken in the context of who, when, where and how they need to be made in order to meet the demands of any given situation.

4.2. The decision-making dependency (DMD) model: 'dependency' factors

When considering how these questions were addressed, in light of the interviews with the nurse managers, it was apparent that eight key characteristics were most influential on their decision making. These eight characteristics or 'dependency factors' can be conceptualized in the form of a model (Figure 2).

4.2.1. Multiplicity of roles, tasks, activities and decisions to be addressed

Nurse managers are expected to multitask and to balance multiple roles. This multiplicity impacted on and challenged how and when they made decisions. Nurse managers are both managers and clinicians, but they also fulfil roles as educator, supporter, supervisor and collaborator. Recognising the impact of these multiple roles on decision making is vital to understanding the complexity of the process of their decision making. "As managers, we are dealing with multitudes of things, not only clinical or professional. We are also dealing with human relation issues and all sorts of things" (Leslie). "The DON is not always around, so sometimes there is no immediate consultation; we must take a decision" (Cathy).

Multiple roles affect productivity and add a time constraint factor to individual decisions that may help to compromise the quality of nurse managers' decisions. Various studies have shown that multiple roles have influenced the assessment, gathering, interpretation, assimilation and

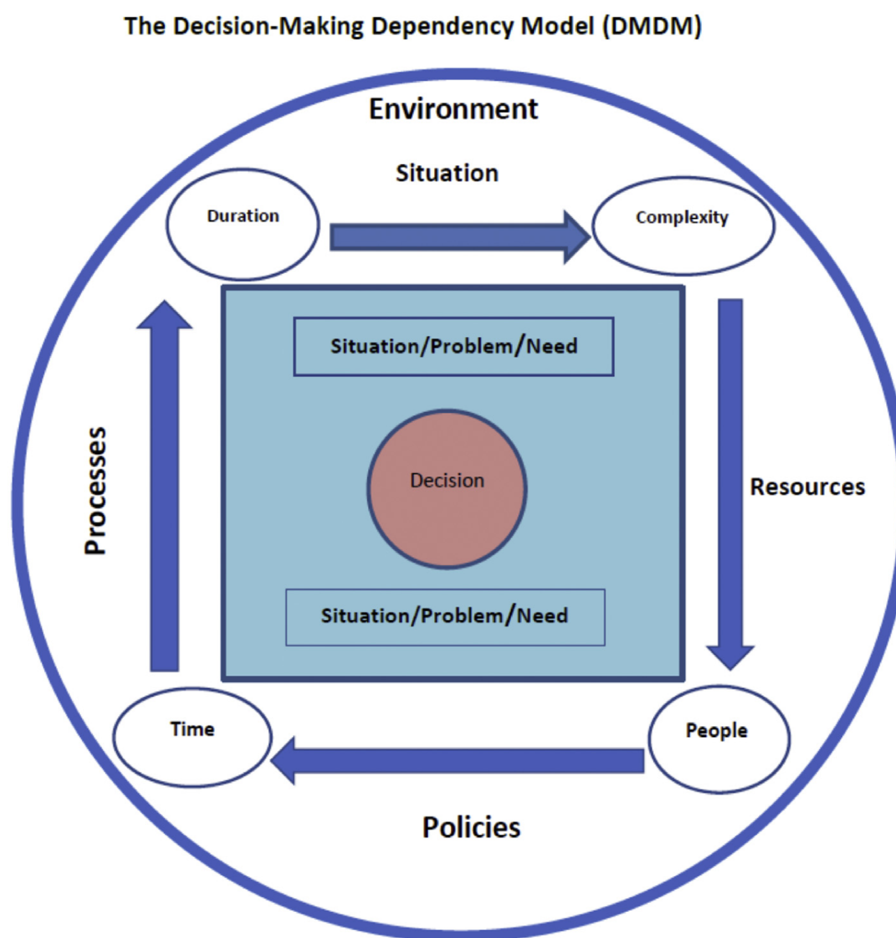

Figure 2. The decision-making dependency (DMD) model.

recall of information and ultimately had an impact on the choices exercised when making a decision (Betsch and Haberstroh, 2005). Furthermore, multiple roles have also been observed to contribute to exhaustion/fatigue which consequently depletes personal resources, affects cognitive abilities and contributes to poor decision making. Other research links multiple roles to stress (Ceschi et al., 2017; Honda et al., 2015). Erikson (2012) argues that multiplicity of roles contributes to confusion regarding the nature of specific roles and therefore contributes to employees being more likely to waste their energy negotiating their roles and responsibilities and ultimately becoming involved in non-productive tasks and poor decision making (Rozario et al., 2004).

4.2.2. Time-frame – available time to make decision

There is a link between decision making and the time available for making the decision. Decisions frequently need to be made within a certain timeframe. This dictates the type of decision and how quickly it needs to be made. The type of situation and type of decision determine how quickly a decision needs to be made. Emergency situations warrant decisions must be made immediately. Such decisions are often both clinically and patient focused and can be life-saving measures. In short, time changes the dynamics of decision making.

4.2.3. Duration - how long it takes for a decision to be made

Certain problems must be solved within a short time period while others need to be explored, investigated or studied before a decision is made. In addition, certain situations require different elements or components to be brought together and examined or viewed in their totality before a decision is made. Seemingly, time and duration factors embrace how quickly a decision should be made and the length of time it takes before a decision is made. In short, time changes the dynamics of decision making in terms of the available time to make the decision and how a decision should be made.

4.2.4. The complexity of the task/decision

The complexity of a situation determines whether consultation processes need to be established. Some situations may be regarded by nurse managers as simple and straightforward to address while others will be viewed as difficult or complicated. Complex situations arise if the problem is not clear to the nurse manager or the situation itself is inherently complex. For example, situations of professional misconduct, dissatisfaction with the care provided and complaints to the hospital are often regarded by nurse managers as complex in nature. These cases are usually referred to the executive. The complexity of a situation determines how decisions are made and at the same time the type of decisions made. The understanding of the complexity of the situation by the manager is likely to have a significant impact on their ability to generate, evaluate, select and apply choices while managing uncertainty, accompanied and complicated by time pressure that will also influence decision making (Ceschi et al., 2017).

4.2.5. Consultation - the number of people who need to be involved or consulted

A consultation process with colleagues can play an important role in how decisions are made. This dependency was observed in situations where decisions were made after other people were consulted and/or made aware of a specific situation. Suggestions or alternatives were then provided on how the issue could be addressed. The need to consult other people, especially other nurse managers from various health institutions,

is based on personal recognition of the need for other people's input and involvement in a decision. This could often improve the quality of a decision made. How decisions are made is dependent on the situation, the presence of other health professionals, the time in which the decision is to be made and the complexity of the decision to be made. As such, nurse managers' understanding of the dynamics of decision making, the relationship between the different types of activities, their own roles, and the time spent on making decisions has a great impact on how their role is performed and on how decisions are made.

4.2.6. Environment

The environment in which a decision is carried out has a great impact on how, when, and the type of decisions made, and who is involved in the decision making. The environment is not only the medium in which the decision is taken, but it also influences how decisions are executed. It comprises factors inclusive of, but not limited to, availability of resources, (including materials and personnel); the nature of the situations handled; and the policies and regulations that influence how decisions are made. For instance, not all procedures can be performed for any given situation, and in some facilities institutional policies dictate that certain decisions must be endorsed by either the Director of Nursing or the executive. Harsh and/or negative work conditions tend to be responsible for work disengagement and negative work performance (Ceschi et al., 2017), including poor decision making. In such cases, the type of environment can have a great impact on decision making. In the clinical area, the environment is affected by the needs of the patient, staff input and/or resource availability.

4.2.7. Resources – the human and material resources needed to action a decision

Resources include human and material aspects in any organisation. The goal of decision making is to improve the functioning of the organisation, which is only possible by available and effective use of resources. Some decisions may not be implemented because requisite resources are unavailable. For example, in some health institutions, due to lack of an obstetrician, delivery of babies cannot be performed. Resources are pivotal to the 4Ws and 1H of the DMD model; in the absence of requisite resources, decision making may be put on hold. Lack of resources also has social consequences that can affect the ability and competence of a decision maker. The positive availability of resources has a motivational effect which can lead to high work engagement and role performance, reducing inertia in decision making (MacDonald-Wilson et al., 2017).

4.2.8. Personal characteristics of the decision makers

This refers to the knowledge and expertise an individual nurse manager can bring to bear on any given decision. Each nurse manager has a different skillset and varying perceptions, attitudes and abilities. This variation means that no two nurse managers will behave identically when faced with a set of decisions. They may make the same decision, but it may take longer for one individual to arrive at that decision than a colleague. In some cases, different decisions will be reached because of how the individual nurse manager perceives the situation or because one individual possesses a different skillset or a different attitude to a colleague (Wu et al., 2016). Barriers to taking a certain course of action may present themselves to one nurse manager but may be dismissed or not recognized by another (Majid et al., 2011; Solomons and Spross, 2010). A key implication is the need for nurse managers to be self-aware, i.e. to understand the personal characteristics affecting their own decision making and which can enhance their ability to take decisive and beneficial decisions.

4.3. Applying the DMD model

Good decision-making practices are not only directly influenced by the cognitive process but also by how the information is weighted, prioritized, and the ability of the nurse manager to recognize and respond efficiently to the situation. Hence there is a need to have models of decision making that help to translate theory into practice (Dowding and Thompson, 2003; Johansen and O'Brien, 2016). One of the greatest challenges in a clinical area is adopting decision-making processes and translating theories of decision making into clinical practice (Krishnan, 2018; Pearson, 2013).

There is a dearth of information on translating decision-making models into practice. This study has identified that despite the numerous decisions made by nurse managers, formal use of set decision-making processes is negligible, with most decisions made without thought to the process used. Although analysing application of the DMD model in practice is beyond the scope of this article, it is important to suggest ways in which it can be applied in the clinical setting.

Applying the DMD model in practice involves scaffolding the steps of the decision-making process. It can be inferred that the use of the model in a clinical setting requires the use of knowledge and skills which are essential to promote engagement with different approaches to decision making. Use of the model seeks to increase the efficiency of decision making, considering that most of the decisions are situation- and client-focused. Nevertheless, the eight dependency factors discussed in this paper indicate the pivotal elements that should be addressed when decisions are made.

Promotion of the model should highlight the benefits of improving the know-how of decision making by managers and, for education purposes, preceded by quality of care and patient safety. In addition, creating an environment that will promote the uptake of the model will require (1) creation of awareness and knowledge among nurse managers and the organisation as a whole, (2) training, diffusion and dissemination, (3) implementation by trial and error, and 4) monitoring and evaluation of the competency review (Titler, 2008).

In light of these observations, this study proposes practical aspects of how to embed the model into management processes. As shown in Figure 3 below, these include determining: 1) the problem, need or situation; 2) the urgency of the need to make a decision about the issue; 3) the type of action required; 4) the attainability of the requisites; 5) the plan of action; 6) the impact of the decision; then 7) executing the plan; and 8) evaluating the outcome of the decision. Carrying out these processes will help address the factors that need to be considered for a decision to be made.

Consideration of the eight factors of the DMD model should be an inherent action of managers when they make decisions, and therefore, the application of the process shown in Figure 3 will enable the model to be operationalized. The model promotes improved decision making by ensuring various considerations are addressed before a decision is made. The use of the model and the process depicted in Figure 3 are important elements in educating nurse managers, so they develop effective management and good problem-solving skills. Inherently, the use of a decision-making process in the clinical area is complex and presents difficult challenges, making it hard to incorporate a fixed process. Arguably, the role of education is therefore vital and educational programs need to be developed to enhance the nurse manager's skills in decision making. The use of the DMD model can play a vital role in this education.

The work with nurse managers discussed in this paper suggests that decision making in health-care facilities could be improved and supported by putting into place support processes to address the Who, When Where, Why and How of decision making. In developing this into the DMD model's eight factors, there is a useful basis provided for understanding not only the process of decision making but also decision dynamics by supplying a basis for the development of decision-making support processes to guide and aid the functioning of nurse managers. The multiple roles and the juggling of many responsibilities by nurse managers in a complex changing environment warrants the use of the DMD model to improve to effective decision-making process.

The DMD model comprises a set of factors on which decisions are based; comprehending these factors can help managers understand and

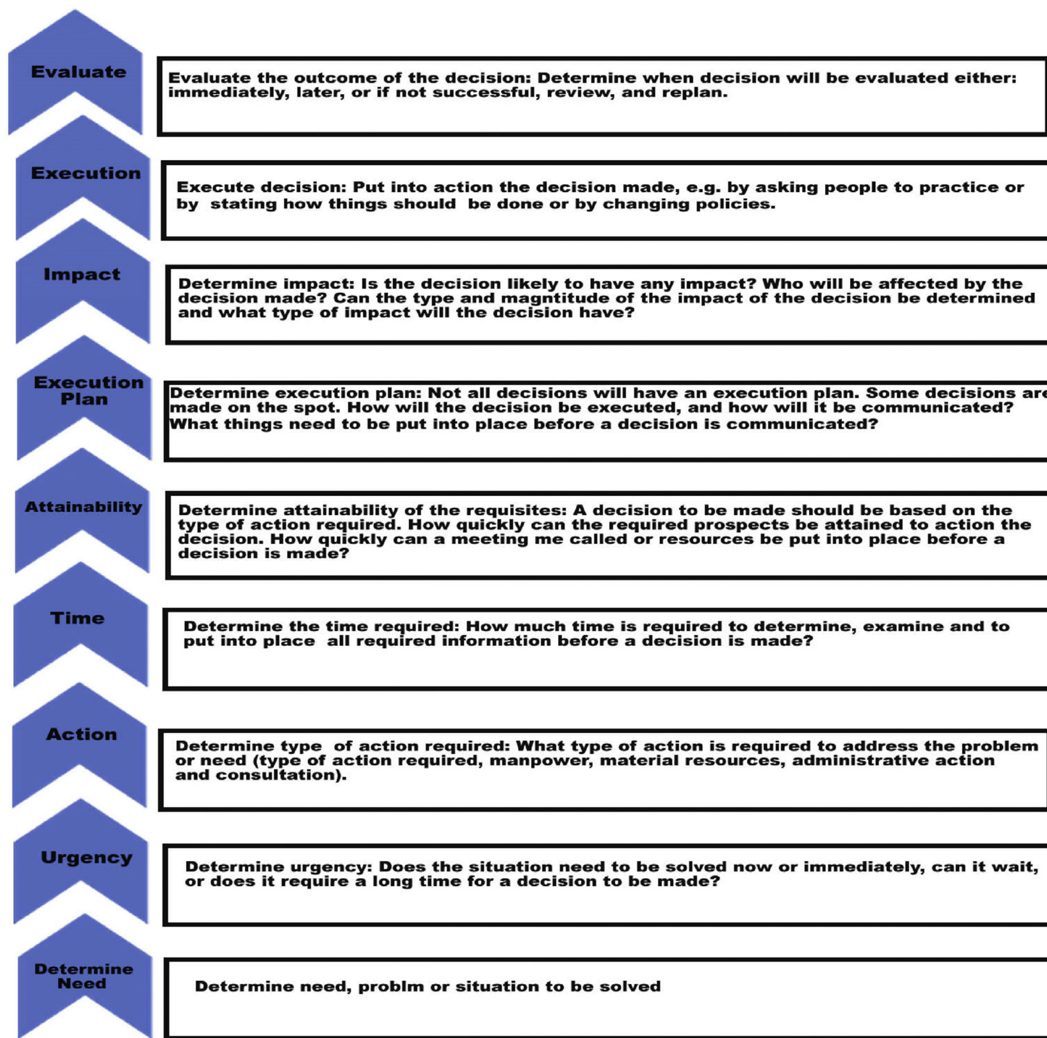

Figure 3. The DMD model: Implementation process.

be aware of the multiple steps to undertake in making a decision and also enable them to be more assured of the wisdom of a decision prior to making it (Akdere, 2011).

The DMD model guides the process of translating decision making into practice. The model suggests that the decision maker needs a good knowledge of the environment in which the decision is carried out (Where), understands the complexity of the situation (How and Why), the duration, that is how quickly a decision needs to be made (When) and the people/resources (Who) involved in the decision. Essentially, these four Ws (Who, Where, When, Why) and an H (How) of decision making translate into the dependency factors of the model. The 4Hs and W can be interrogated prior to making important decisions or a more formalized application utilizing the eight dependency factors could be applied before a decision can be sanctioned. Addressing the factors could greatly influence how decisions are made and have a great impact on the overall functionality of the nurse manager.

We suggest that using the DMD model could reveal that it is possible for decision making to be improved, allowing for exercise of different management styles to be adopted relating to a given situation and context by taking the dependency factors into consideration. It is strongly contended that using the model could allow for further exploration and examination of its components, and by so doing help affirm the decision to be made. In effect, consideration of the eight factors acts as the 'scaffolding' for the decision ultimately taken. By considering this scaffolding, decision makers can have the opportunity to explore a potential decision from all angles and determine the best choice from a set of alternatives.

Leaders and managers in any organisation should weigh all the necessary options and the outcomes of vital decisions while being aware that each decision may either affect the client or the entire organisation in one way or another. Thus, the use of the DMD model can help make a deliberate, thoughtful decision by ensuring that the information applied to the decision has not only had an injection of input through consultation processes but has also been applied to Who, When, Where, Why and How in order to ask the appropriate questions and therefore strengthen the decision made. It is therefore imperative for managers and leaders to develop strategies that develop the abilities that enable managers to think through the 4Ws and 1H of a decision-making process. By applying these elements to decision making, nurse managers are more likely to cope with complexity and challenging situations.

Decisions require multi-level considerations and the DMD model could be most useful as a means of generating productive discussions regarding the capacity for effective decision making by contemplating its eight components. It is therefore important to understand and create conditions under which effective decision-making processes can be embraced, which remains a high-priority management issue.

5. Conclusions

Decision making is one of the most challenging, complex and active areas of leadership and management. Understanding the process by which managers make decisions is important to understanding and improving the decisions they make in an organisation. While some choices in the decision-making process may be regarded as being simple and easy, most organisational decisions are complex, challenging and often require a multi-step approach to making the 'right' decision.

Effective management necessitates that managers apply good judgement and possess insights into a range of different situations. Decision making is central to management activities within any organisation, and in health-care settings, decision making must meet strong professional expectations and high ethical demands as the decisions involve human life and wellbeing (Mallari and Joseph, 2016). Yet, there is a dearth of previous research on the processes used by nurse managers to make decisions, including clinical decisions that are central to the effective operation of health-care facilities. This paper has elucidated the types of decisions made and the process of decision making by nurse managers, highlighting three main areas of decision making, namely executive, managerial and clinical. The who, what, where, why and how (4 W's and 1 H) are identified as the key questions raised when making decisions. These questions can be answered by referring to eight characteristics or factors identified by the nurse managers as the key elements underpinning the decision-making process. The elements have been portrayed here in a decision-making dependency (DMD) model, which can be used as a support mechanism for making important decisions.

Future studies should examine and investigate whether specific training programs could incorporate the DMD model to improve decision making. This would focus on the 4Ws and 1H and the eight dependency factors. In addition, they could identify what additional support needs to be supplied to improve decision-making processes for nurse managers, which in turn would positively increase their performance and functionality. However, we acknowledge that our current investigation has two principal limitations, namely the small scale of the survey of nurse managers and the lack of formal application of the DMD model. In defence of the sample size for the survey, we note that saturation was reached when $n = 15$. However, a more wide-ranging sample that included nurse managers working in a bigger range of health institutions could render the thematic nature of our findings, and hence the composition of the model, more robust. In terms of testing the model, that will be the next stage of this research project. For now, we recommend that application of the process shown in Figure 3 will enable the model to be operationalized.

Declarations

Author contribution statement

C. Chisengantambu-Winters: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

G. Robinson and N. Evans: Analyzed and interpreted the data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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