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the prompt(s):

1. Please suggest relevant areas of research and keywords to help me locate academic sources related to the Working Memory Model and cognitive performance.
2. Please review my writing for clarity, grammar, and academic style without changing the meaning of my work.
3. Please assist me in checking APA 7th edition referencing and citation formatting.

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CASE REPORT

The role of Working Memory Model in Healthcare Performance

BACKGROUND TO THE REPORT

Infections that revolve around healthcare remain a significant concern among healthcare settings, as any failures to prevent infection can result in serious consequences for patients. Among these practices, effective hand hygiene is one of the major strategies to prevent any infections, though maintaining compliance among healthcare workers remains a challenge (Alhumaid et al., 2021; Erasmus et al., 2010). Research has posited that healthcare workers may demonstrate adequate knowledge of infection prevention procedures while still experiencing difficulties maintaining compliance, suggesting that there are factors beyond knowledge itself can influence subsequent adherence to safety procedures (Alhumaid et al., 2021).

The case study of Glynafonshire Health Board is an example of this issue. The health board had established a strict handwashing policy requiring district nurses to adhere to follow specific handwashing procedures before and after entering patients' properties. The policy and correct handwashing techniques were included as a part of nurses' training, and all district nurses were required to complete written and practical assessments to prove their understanding and competency of the said procedure. However, despite passing these assessments, few of the nurses were found to inconsistently follow the policy. The reported issues included wrong handwashing techniques, rushed application of the procedure, and failing to wash their hands before and after visiting patients. These failures caused eight patients to contract serious infections and also one fatality.

The health board identified that these problems occurred during a period of increased workplace demands. The district nurses provided information that indicated staff shortages and an increase in patients caused subsequent longer working hours. Furthermore, some nurses worked back-to-back shifts and provided care for double the number of patients they would normally visit.

THE WORKING MEMORY MODEL THEORY

The Working Memory Model (WMM) was developed by Baddeley and Hitch (1974) as an alternative comprehension to earlier created models of memory that posited short-term memory mainly as a temporary storage system. The model was developed because previous explanations regarding short-term memory could not fully cohere with findings from neuropsychological research, including cases where individuals with short-term memory impairments were still able to retain information with long-term memory. To address these limitations, Baddeley and Hitch posited that working memory acts as an active cognitive system with limited capacity to both storing and processing information instead of a mere simple storage mechanism (Baddeley & Hitch, 1974, as cited in Catinas et al., 2021).

In contrast to short-term memory, working memory involves actively synthesising information during complex cognitive activities. For instance, individuals are able to maintain information while using it to complete a task by utilising their working memory. The model demonstrates that the working memory consists of several components which are the central executive, the phonological loop, the visuospatial sketchpad, and the episodic buffer (Baddeley, 2010, as cited in Catinas et al., 2021).

The central executive is seen as the central controlling component of the Working Memory Model. It acts as an attentional control system that regulates the flow of information within working memory and coordinates the activities within the other components. The central executive does not necessarily store information but instead manages attention, chooses relevant information, and binds information with other cognitive processes. Not to forget, the central executive works within limited capacity, meaning that cognitive performance may be hindered when individuals are required to manage multiple demands at the same time (Gathercole, 2008; Buchsbaum & D'Esposito, 2018, as cited in Catinas et al., 2021).

The phonological loop on the other hand oversees temporarily storing and processing auditory and verbal information. Initially referred to as the articulatory loop, the concept later has evolved into the phonological loop to provide a more accurate representation of its role in temporarily maintaining speech-based

information. This component allows individuals to retain any verbal information through temporary storage and rehearsal processes (Baddeley, 2000; Baddeley, Hitch, & Allen, 2019, as cited in Catinas et al., 2021).

The visuospatial sketchpad oversees temporary storage and manipulation of visual and spatial information. Individuals are able to process visual, geographical and spatial information due to this component. As per to the model, visual and spatial information can be accessed through sensory input or is retrieved from long-term memory, allowing a person to mentally represent and manipulate visual information during cognitive tasks (Baddeley, 2000, as cited in Catinas et al., 2021).

Baddeley (2000) later expanded the Working Memory Model by adding the episodic buffer. It was introduced to explain how information from different components of working memory could be integrated into a single temporary representation. It allows information gathered from the phonological loop, visuospatial sketchpad, and long-term memory to be integrated, allowing individuals to form meaningful relevant representations of experiences and information (Baddeley, 2000, as cited in Catinas et al., 2021).

Research that put working memory under the microscope has also highlighted the relationship between working memory capacity and executive functions. For instance, McCabe et al. (2010) examined the relationship between working memory capacity and executive function, positing that the capacity of working memory is closely linked with executive control processes involved in complex cognitive tasks. Furthermore, research examining the interactions between working memory and attention has suggested that attention is crucial in maintaining and manipulating information in the realms of working memory systems. (Awh et al., 2006, as cited in Catinas et al., 2021).

HOW DOES THE THEORY RELATE TO THE CASE STUDY

The Working Memory Model (WMM) helps providing a possible explanation on how healthcare professionals may face difficulties implementing important safety procedures when they are being imposed with demanding working conditions. The model proposes that working memory is a limited-capacity system that oversees temporarily maintaining and processing information required for ongoing activities. A central component of the model is the central executive, which manages attention, organises information, and manages simultaneous cognitive demands (Baddeley, 2000, as cited in Catinas et al., 2021). Hence, when individuals are handling multiple tasks at the same time, the availability of cognitive resources for monitoring and controlling behaviour may be hindered.

This mechanism is relevant to the case of Glynafonshire Health Board because the nurses are expected to flawlessly perform hand hygiene while a high demand is imposed onto them during their work. Despite the fact that the nurses had gone through meticulous training and had demonstrated their competency through written and practical assessments, some eventually failed to consistently adhere to the handwashing procedures by rushing the process, using inaccurate techniques or failing to wash their hands before and after patient visits.

Central executive is relevant because the district nurses must simultaneously juggle their attention between different components of patient care. This could be processing clinical information, appropriate respond to different patient needs, coming up with suitable decisions and communication, and complete required procedures. When multiple

demands take place at the same time, their working memory must allocate resources between different tasks. Research by McCabe et al. (2010) posited that working memory capacity is linked to executive attention, implying that the ability to regulate attention and manage competing cognitive tasks is a crucial factor in complex task completion.

In this case, the nurses are facing few drawbacks such as staff shortages, longer working hours, back-to-back shifts, and caring for double the normal number of patients. These drawbacks may have amplified cognitive workload by requiring nurses to process greater amount of information and manage more tasks with time pressure. Research involving healthcare workers has pointed out that higher workload levels can hinder work performance (Asamani et al., 2015), while increased subjective workload has also been associated with cognitive failures among nurses (Mohammady et al., 2020).

Hence, the model can be used as an explanation for the incident as a possible interruption in the monitoring and execution of a known crucial procedure instead of simply forgetting the handwashing policy. Handwashing policy requires nurses to recognise when the procedure is required, remember the correct sequence, and ensure completion at suitable points of time during patient care. Under conditions where high workload and fatigue is very prominent, attention may have been prioritised towards immediate patient care concerns, increasing the possibility that routine safety behaviours are rushed. Research on fatigue among nurses has demonstrated that reduced alertness and

tiredness can hinder performance and patient safety, particularly in demanding healthcare environments (Rogers, 2008).

However, the Working Memory Model does not provide a complete explanation of the incident. The nature of the case can also be stretched towards broader organisational factors, such as the staffing shortages and increased workload, which may have contributed to the environment where errors occurred. To support this, research on hand hygiene compliance indicates that adherence is not only influenced by knowledge, but also several factors, including workload, environmental conditions and organisational support (Erasmus et al., 2010; Alhumaid et al., 2021).

SUGGESTIONS FOR NEW PROCEDURES BASED ON THE THEORY

One procedure that could be implemented is the utilisation of external cognitive aids, such as checklists and structured prompts, to further consolidate healthcare workers when performing safety-critical tasks. The Working Memory Model proposes that working goes through drawbacks when they are required to maintain information while engaging in multiple demands at the same time. Hence, rather than relying solely on the healthcare workers' memory, external supports can be used to reduce the amount of information that must be actively retained in working memory.

In the lens of this case, cognitive aids consists of brief hand hygiene checklists, reminder prompts, or structured checkpoints before and after patient contact. These tools would not be a form of new knowledge or act as a replacement of existing training, but instead as external memory supports by helping nurses maintain attention towards required safety behaviours during times where demands are high cognitively.

The implementation of cognitive aids has been explored in healthcare settings. Grundgeiger et al. (2019) examined cognitive aids in acute care environments and emphasised that these tools can assist healthcare professionals by minimalising cognitive demands and helping with coordination of task during intricate situations. Likewise, Webster (2017) discussed the role of checklists and cognitive aids in patient safety, elaborating that these tools important steps can be completed consistently and omissions can be reduced with the help of these tools. Based on these findings, the recommended approaches could be adapted within district nursing practice to provide them with additional tools to maintain hand hygiene procedures.

Second procedure could be to focus more on reducing workload conditions that place more demand on working memory. The Working Memory Model suggests that cognitive resources can be scarce, meaning that performance may be hindered when individuals must manage more information than their cognitive systems can process. In the Glynafonshire Health Board case, the issues such as staff shortages and back-to-back shifts

may have increased the number of tasks nurses needed to complete while depleting cognitive resources available to monitor routine safety behaviours.

Therefore, healthcare organisations should take into consideration regarding procedures such as reviewing staffing numbers, allocating suitable number of patients, and reducing excessive working hours. These changes targets to minimise unnecessary cognitive demands instead of expecting healthcare personnels to compensate by driving more self-effort alone. Research consolidates the link between workload and performance, with Asamani et al. (2015) finding that workload levels influence healthcare workers' performance. In addition, Mohammady et al. (2020) identified a correlation between subjective workload and cognitive shortcomings within nurses, proposing that demanding working conditions may influence negatively towards performance.

EVALUATION AND CRITIQUE OF THEORY

The Working Memory Model provides a useful insight of how cognitive limitations can be a deciding factor of performance during complicated tasks. One strength of the model is that it further comprehends the role of working memory and executive attention in task performance. Research by McCabe et al. (2010) examined the relationship between working memory capacity and executive functioning and discovered that these abilities share the same executive attention component. This finding consolidates the idea that working memory capacity dictates an individual's ability to manage attention and manage competing cognitive demands. In the lens of the case, it is relevant where nurses demonstrated competency but experienced difficulties maintaining proper hand hygiene routine.

The model is also backed by empirical research within healthcare settings. Asamani et al. (2015) discovered that workload levels influenced healthcare workers' performance, while on the other hand, Mohammady et al. (2020) identified an association between subjective workload and cognitive failure among nurses.

Nevertheless, Working Memory Model provides a half explanation of the incident. The model focuses solely on internal cognitive processes and does not entirely provide an explanation on how external factors influence hand hygiene compliance. Research has suggested that adherence to infection prevention procedures is also affected by factors such as workload levels, environmental constraints, and organisational support (Erasmus et al., 2010; Alhumaid et al., 2021). Hence, while the model provides us with plausible explanation, it should be considered hand in hand with wider workplace factors

CONCLUSION AND RECOMMENDATIONS

The Glynafonshire Health Board case emphasised that healthcare errors may occur even when robust training has been done. Although the district nurses fully understood the significance of hand hygiene procedures, maintaining reliable performance becomes challenging in the presence of increased workplace demands. The Working Memory Model provides a useful insight for this case by underlining the scarce capacity of cognitive systems at play during attention, processing of information, and task monitoring. Under demanding conditions, healthcare workers may face challenges to consistently and persistently apply safety-critical behaviours.

Followed by this understanding, preventing similar cases calls for more than merely improving knowledge through additional training. Instead, interventions should shine more light on supporting cognitive performance by minimising unnecessary workload demands and introducing external supports such as cognitive aids and structured procedures. Nonetheless, the incident should also consider organisational factors such as staffing constraints and workload conditions. All in all, the Working Memory Model provides insightful cognitive perspective to further comprehend and understand healthcare performance, while acknowledging that safe practice requires both individual and organisational effort.

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