

SMARTPHONE DEPENDENCY, DIGITAL AMNESIA, AND THE QUALITY OF PATIENT CARE IN YOUNG NURSES IN THE TERTIARY CARE HOSPITAL OF PAKISTAN: A CROSS-SECTIONAL STUDY

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Abstract

The connection between smartphone addiction, digital amnesia, and patient care quality among young nurses working in the tertiary care hospitals in Pakistan is analysed in the research paper. Since the adoption of digital technologies in healthcare is increasingly becoming more of a fact, nurses tend to use smartphones to retrieve information, communicate, and offer clinical support. However, excessive dependency on these devices may lead to digital amnesia whereby individuals have become unable to utilize internal memory since they are forced to save data in external digital memory. The research design applied was quantitative cross-sectional and correlational and structured questionnaires were used to collect data on 100 registered nurses aged 21-35 years. These findings showed that the participants had an average to high level of smartphone addiction and digital amnesia. The patient care quality was significantly and negatively correlated with the smartphone dependency and digital amnesia, and there was a strong positive correlation between the smartphone dependency and digital amnesia. Regression analysis showed that digital amnesia was a significant predictor of poor patient care outcomes and it mediated the correlation between smartphone dependency and patient outcomes. The paper identifies the cognitive and clinical dangers of excessive smartphone use in nursing practice and the need to have a balanced approach to the use of digital tools, not to mention the steps to improve the memory and clinical judgment skills.

Keywords: Smartphone Dependency, Digital Amnesia, Patient Care Quality, Nursing Practice, Clinical, Decision-Making, Cognitive Offloading, Healthcare Technology, Young Nurses, Tertiary Care Hospitals.

1. Introduction

Background

The fast development of digital technology has radically changed the healthcare systems globally, and nursing practice is not an exception (Firth et al., 2019; Bautista and Lin, 2020). The last ten years have seen the implementation of smartphones, tablets, and other digital gadgets in clinical settings transform the manner in which nurses access, process, store, and retrieve information (Cho and Lee, 2016; Lee et al., 2020). These gadgets make clinical guidelines, drug references, patient records, and communication platforms readily accessible and, as a result, make them more efficient and capable of saving time on information search (Bautista and Lin, 2020). Smartphones are no longer a personal device in tertiary care hospitals, but they are also an informal clinical tool that nurses use when attending to patients (McBride et al., 2017). Besides bringing accessibility and convenience closer, these technological changes have brought new cognitive and professional issues that must be resolved by means of systematic research (Firth et al., 2019).

Among the new issues of cognitive psychology and the study of digital behavior, it is possible to note the so-called digital amnesia, or the propensity to lose the information, which an individual believes to be easily available through the digital devices (Wilmer, Sherman, and Chein, 2017; Barr et al., 2015). The population is shifting towards external digital storage, abandoning the idea of knowledge storage, to the use of external digital storage in the form of smartphones, search engines, and cloud-based applications (Risko and Gilbert, 2016; Firth et al., 2019). This mental offloading mechanism decreases the amount of information that should

be stored in the internal memory but undermines the long-term memory retrieval skills (Dong and Potenza, 2022). The overuse of digital devices in the healthcare environment, where the ability to make correct and fast decisions is critical, can affect the cognitive functions, clinical judgment, and professionalism of nurses (Cho and Lee, 2016; Bautista and Lin, 2020). Digital amnesia is also a concept that is especially applicable to young nurses who are more technologically savvy and more often use smartphones both at work and in their personal lives (Wilmer et al., 2017).

Smartphone addiction has become another major behavioral challenge among medical workers, particularly the young generations who have been raised in a digitally interconnected world (Kim et al., 2019; Elhai et al., 2017). A large number of young nurses constantly use smartphones in the course of the day, communicating, looking up information, socializing, and entertaining (Al-Kandari and Al-Sejari, 2021). Although moderate usage of a smartphone is healthy, overreliance may cause distraction, loss of attention, and a state of cognitive load (Wilmer et al., 2017; Firth et al., 2019). Smartphone addiction can disrupt professional duties and patient safety in clinical settings, where nurses are required to be very focused, emotionally stable, and critical (Lee et al., 2020). Although the use of digital technology is increasing, there is a lack of empirical studies on the interaction of smartphone dependency and digital amnesia, as well as the impact of both variables on nursing practice and patient outcomes (Bautista & Lin, 2020).

The healthcare sector of Pakistan is gradually becoming digital, especially in tertiary care hospitals of the largest cities in Pakistan, including Islamabad, Rawalpindi, Lahore, and Karachi (Khan et al., 2021). Electronic health records, online communication systems, and digital monitoring systems are also adopted in many hospitals, which makes nurses even more exposed to digital technology (Naseer et al., 2022). Simultaneously, the number of individuals who own smartphones and have access to the internet has grown tremendously among young professionals and nurses are no exception (Pakistan Telecommunication Authority, 2023). Nevertheless, there is a gap in the literature that analyzes the cognitive and clinical effects of this technological addiction in nurses in the Pakistani context with a systematic study (Ali et al., 2020). The majority of the current research in Pakistan has been on the topic of smartphone addiction in nursing students and its influence on academic performance, mental health, or overall well-being, as opposed to its effects on clinical practice and patient care (Riaz et al., 2019; Zafar et al., 2021).

Since nurses play a crucial role in patient safety, quality of care, and clinical decision-making, it is necessary to learn whether digital amnesia and smartphone dependency are a potential risk in clinical practice (Cho and Lee, 2016; Lee et al., 2020). Provided that nurses use digital devices too much, rather than personal knowledge and clinical judgment, it can influence their capacity to remember the necessary information, act in emergencies, and interact effectively with the patients (Firth et al., 2019). Hence, the proposed research intends to examine the association between smartphone addiction, digital amnesia, and patient care in young nurses in tertiary care hospitals in Pakistan and thus address a major gap in the national and global nursing research (Bautista and Lin, 2020).

Problem Statement

Although smartphones and digital tools are widely used in the clinical nursing practice, the empirical evidence on the level of digital amnesia among young nurses in Pakistan is scarce (Ali et al., 2020). Although technology has helped to increase the accessibility of information, it is not well known whether the overuse of digital devices has adversely impacted the memory retention, clinical reasoning and decision-making capabilities of nurses (Wilmer et al., 2017; Firth et al., 2019). Moreover, the connection between smartphone addiction and digital amnesia has not been properly studied in the Pakistani healthcare setting (Zafar et al., 2021).

The current studies in Pakistan concentrate on smartphone addiction among nursing students and not on working nurses in the tertiary care hospitals (Riaz et al., 2019). These publications do not cover the cognitive implications of digital dependence and its possible effect on the quality and safety of patient care (Ali et al., 2020). Consequently, there is a knowledge gap that is critical in terms of understanding the effect of digital amnesia on nursing performance, clinical efficiency, and patient outcomes in the high-pressure hospital settings (Cho and Lee, 2016). This research aims to fill this gap by carrying out a systematic study on the topic of digital amnesia and smartphone dependency and their impact on patient care among young nurses in the tertiary care hospitals in Pakistan.

2. LITERATURE REVIEW

Cognitive Functioning and Digital Amnesia

Digital amnesia has become a significant field of study in psychology and behavioral science, especially as the use of digital technology is becoming more prominent (Wilmer et al., 2017; Firth et al., 2019). Research has indicated that people are likely to forget the information when they are aware that they can easily access it online through their smartphone or via the internet (Risko & Gilbert, 2016). This effect is associated with cognitive offloading, which consists of people entrusting their minds with the memory storage task to external devices (Dong and Potenza, 2022). Although this can help to decrease cognitive load under certain circumstances, it can also undermine long-term memory recall and retrieval skills (Wilmer et al., 2017).

It has been proposed that digital amnesia influences the working memory, attention, and information processing (Firth et al., 2019). The excessive use of digital technology makes people less involved in intensive thinking, which is required to achieve long-term learning and memorization (Barr et al., 2015; Dong and Potenza, 2022). This decreased mental activity can be very dangerous in high-stakes careers like the healthcare sector (Cho and Lee, 2016). Nurses, who must not forget complicated clinical data, dosages, patient history, and emergency procedures, can have problems with recalling important information when they become over-reliant on digital tools (Lee et al., 2020).

The number of international studies has shown that a high level of digital dependency correlates with lower memory and higher cognitive dependence (Wilmer et al., 2017; Firth et al., 2019). These results indicate the necessity to investigate the topic of digital amnesia in the professional setting, especially in the sphere of nursing, where memory and critical thinking are key factors of patient safety and clinical effectiveness (Bautista and Lin, 2020).

Addiction to smartphones among healthcare workers

The subject of smartphone dependency among students, the professional community, and medical personnel has been actively researched in various countries (Elhai et al., 2017; Kim et al., 2019). It has been shown that young adults, nurses, and medical workers use smartphones at a high level in their personal and professional lives (Al-Kandari and Al-Sejari, 2021). There are a lot of healthcare providers who access smartphones as a source of clinical reference, communication, patient information, and education (Bautista and Lin, 2020). Although these applications can be useful, overuse can produce adverse effects as it can cause distraction, lack of concentration, and poor performance at work (Wilmer et al., 2017).

Research has been done among nurses in different countries and has discovered that high levels of smartphone dependency correlate with stress, anxiety, and low job satisfaction (Kim et al., 2019; Lee et al., 2020). The use of smartphones may disrupt nurse-patient communication, decrease situational awareness, and create the possibility of medication administration and patient monitoring errors in a clinical setting (Cho & Lee, 2016). Other studies have also indicated that nurses who use smartphones regularly during clinical practice have a higher likelihood of developing lapses in attention and missing vital clinical indicators (Bautista and Lin, 2020).

In Pakistan, studies have primarily involved dependency of smartphones among nursing students, but not among practicing nurses (Riaz et al., 2019; Zafar et al., 2021). Several studies have indicated that the levels of smartphone addiction are high in undergraduate nursing students, and there are strong negative associations between smartphone dependency and academic performance (Ali et al., 2020). Nevertheless, these articles lack the cognitive or clinical implications of smartphone use in actual hospital practice, which is why additional research is necessary among working nurses (Naseer et al., 2022).

Digital amnesia and clinical decision-making

Nurses must possess powerful cognitive abilities in their clinical decision-making, such as the ability to recall, think critically, solve problems, and be aware of the situation (Cho and Lee, 2016). These processes may be disrupted by the digital amnesia that affects the ability of the nurses to recollect the important clinical information without the assistance of the digital tools (Wilmer et al., 2017). This situation may occur when nurses have too many uses of smartphones, even to find simple clinical information, their internal resources do not work efficiently, and the decision-making process will be slow and the nurses will not trust their clinical skills (Firth et al., 2019).

As per the studies concerning the cognitive psychology area, the reliance on the external memory tools can result in the dependency loop because more and more individuals are addicted to digital devices and cannot think without them (Risko and Gilbert, 2016; Dong and Potenza, 2022). Delayed recall or uncertainty in clinical judgment may be severe in emergency departments and intensive care units, which are high-pressure settings (Lee et al., 2020). Thus, to provide patient safety and quality care, the effects of digital amnesia on clinical decision-making should be understood (Bautista and Lin, 2020).

The Use of Smartphones and the Quality of Patient Care

There are some studies that investigate the connection between smartphone usage and patient care in healthcare facilities (Cho & Lee, 2016; Bautista and Lin, 2020). Though smartphones can enhance communication and access to information, their application in clinical practice has been associated with a lack of nurse attentiveness and professionalism (Lee et al., 2020). Patients will feel that the nurses who spend most of their time on their phones are not interested in them or involved in their treatment, which will adversely affect patient satisfaction (Al-Kandari and Al-Sejari, 2021).

In terms of the patient safety factor, the issue of smartphone distraction has been cited as a potential risk factor of medication errors, documentation errors, and slow response to patient needs (Cho and Lee, 2016). Research has shown that nurses who are always distracted with their mobile phones are likely to miss crucial clinical signs or take more time to attend to the crisis of their patients (Bautista and Lin, 2020). These results demonstrate the need to study the effect of digital amnesia and smartphone dependency on patient care outcomes as a whole (Firth et al., 2019).

Knowledge Gap in the Pakistani Context

Though there is a number of studies conducted in Pakistan that investigated smartphone addiction among nursing students, a large gap in the research investigating the concept of digital amnesia among practicing nurses exists (Ali et al., 2020; Zafar et al., 2021). The current literature lacks the proper discussion of the impact of digital dependency on the cognitive functioning of nurses, their clinical decision-making, and the quality of patient care in tertiary care hospitals (Naseer et al., 2022). Moreover, the factor of smartphone dependency and digital amnesia, combined with its impact on the Pakistani healthcare system, has not been investigated in a comprehensive manner (Khan et al., 2021).

This gap gives good reasons to justify the present study, as it will produce empirical evidence on a topic in nursing research that has not been well explored (Bautista & Lin, 2020). The

results will also be added to the national and international digital behavior, cognitive psychology, and nursing practice literature (Firth et al., 2019).

Theoretical Underpinning of the Research

This paper is guided by metacognitive theory, cognitive load theory, and self-regulated learning (Schraw et al., 2016; Panadero, 2017). According to the metacognitive theory, the level of knowledge of the way people think and what they remember affects their learning and decision-making (Schraw et al., 2016). The awareness of the dependence of nurses on digital equipment in the framework of digital amnesia can influence their cognitive processes and clinical judgment (Firth et al., 2019).

The cognitive load theory is the theory that excessive use of external tools may cause mental overload and decrease the ability of the brain to process and retain information at a deeper level (Sweller et al., 2019). The self-regulated learning theory underlines the significance of reflection, self-monitoring, and independent problem-solving that can be undermined in case people become over-dependent on digital technology (Panadero, 2017).

Combining these theoretical approaches, this research offers a solid conceptual basis for studying the connection between smartphone dependency, digital amnesia, and patient care in nursing practice (Bautista and Lin, 2020).

Synthesis of Literature

The analyzed literature has a common idea that although digital technology has brought beneficial changes to healthcare, overdependence on smartphones can lead to unwanted cognitive and clinical outcomes (Firth et al., 2019). Young nurses are more likely to be addicted to smartphones, and these features cause distraction and poor performance at work (Kim et al., 2019; Lee et al., 2020). Cognitive offloading can lead to the development of digital amnesia that can impair memory retention and clinical reasoning skills (Wilmer et al., 2017). All of these can deteriorate clinical decision-making and quality of patient care (Bautista & Lin, 2020). Nevertheless, empirical studies that directly relate these variables in the Pakistani tertiary care hospitals are limited (Ali et al., 2020; Naseer et al., 2022). This paper aims to address this gap by conducting a systematic study of these associations between young nurses in Pakistan and making contributions to the nursing practice and the healthcare policy (Khan et al., 2021).

3. Methodology

Research Design

The research design adopted in this study was a quantitative, cross-sectional, and correlational research design in order to investigate the relationship between smartphone dependency, digital amnesia, and patient care in young nurses in tertiary care hospitals in Pakistan. It was deemed that a quantitative approach would be suitable since it is possible to objectively measure variables and statistically analyze the relationship between them (Creswell & Creswell, 2018). The cross-sectional design of the study allowed the researcher to collect data at one moment in time and give a picture of the level of smartphone dependency and digital amnesia among the participants of the research (Polit and Beck, 2021). It was decided to use a correlational design to identify the strength and direction of relationships between dependency on smartphones, digital amnesia, and the quality of patient care without controlling any variables (Field, 2018).

Study Setting

The research was carried out in a major hospital of a major city in Pakistan. This is a specialized medical and surgical hospital that has a high number of nursing personnel working in a high-demand clinical setting. The sampled setting was a medical ward, surgical ward, intensive care unit, and emergency department to make sure that there was a variety of clinical areas where cognitive performance and decision-making play a vital role. The tertiary care hospital was selected based on the high number of patients, the use of technology, and

the use of digital solutions, including electronic health records and online clinical resources (Khan et al., 2021; Naseer et al., 2022).

Study Population

The target population was the young registered nurses between the ages of 21 and 35 years who were directly engaged in patient care in the tertiary care hospitals in Pakistan. The reason behind the choice of this age group is that the young nurses would be more inclined to use a smartphone and more technologically active than the older groups (Elhai et al., 2017; Kim et al., 2019). Nurses who held an administrative role, managerial role, or a non-clinical department were excluded from the study since they do not routinely participate in bedside patient care and clinical decision making.

Sample Size and Sampling Technique

Statistical power analysis was used to determine the sample size to provide sufficient representation and accurate estimation of the relationships between the study variables (Polit and Beck, 2021). The sample size of 100 was deemed to be enough to identify moderate correlations with reasonable statistical power at a 95 percent confidence level (Field, 2018). The method of non-probability convenience sampling was selected because of the constraints of accessibility and the heavy working schedules of nurses in the hospital environment. The participants were recruited in the various clinical units to provide variability in clinical exposure and working environment. Despite the benefits of probability sampling in improving the generalizability of the results, convenience sampling is usually employed in hospital-based nursing research because of the feasibility in practice and time constraints (Etikan et al., 2016).

Research Instruments

The data were gathered through the use of a structured self-administered questionnaire that had four sections. The demographic section comprised the following details: age, gender, education level, years of clinical experience, and the department of employment. The second part involved smartphone dependency, which was measured by a standardized Smartphone Addiction or Dependency Scale based on the previous validated instruments, which evaluated the patterns of excessive use, withdrawal symptoms, and interference with daily activities (Kwon et al., 2013; Kim et al., 2019). The third part determined digital amnesia based on a digital memory reliance scale, a modification of the existing scales of cognitive offloading and digital dependence, which measure the degree to which people depend on digital devices to remember information (Wilmer et al., 2017; Dong and Potenza, 2022). The fourth section assessed patient care quality and clinical decision-making based on a self-reported nursing care performance scale derived from previous nursing research tools (Cho and Lee, 2016; Lee et al., 2020).

Instrument validity and Reliability

The relevance, clarity, and cultural appropriateness of the instruments were determined by reviewing the tools by experts in the field of nursing education and clinical specialists to establish content validity. A pilot test was conducted on a small sample of nurses who were not part of the final sample to determine the understanding and the reliability of responses (Polit and Beck, 2021). The internal consistency reliability was assessed with the help of the Cronbach alpha coefficient, and the values equal to 0.70 and above were regarded as acceptable to conduct research (Taber, 2018). The smartphone dependency and digital reliance scales have a satisfactory reliability and validity in previous studies conducted in similar populations (Kim et al., 2019; Dong and Potenza, 2022).

Data Collection Procedure

Data collection was done following formal permission by the hospital authorities and ethical approval by the institutional review board. The participants were contacted during duty breaks and presented with the purpose of the study, voluntary participation, and anonymity of the

answers. Before the questionnaires were distributed, informed consent was taken in writing. The questionnaires were administered either in paper or electronic form based on the hospital policy and the preference of participants. The respondents were allowed enough time to fill out the questionnaire and were asked not to consult their colleagues on the answers to guarantee that they would not be biased in their responses. Questionnaires that had been filled in were gathered and verified to be complete before data entry. The process assisted in making sure that it was accurate and that there was minimal missing data (Creswell and Creswell, 2018).

Ethical Considerations

The study followed ethical principles of autonomy, confidentiality, beneficence, and non-maleficence. The involvement was purely voluntary, and the respondents were free to leave the study without any reprisals. No personal data, including names and employee numbers, was gathered to guarantee anonymity. The data were carefully stored and could only be accessed by the researcher. The research was not very risky to the participants, as it was conducted through the use of questionnaires only, without physical or psychological intervention (Polit and Beck, 2021). Data collection was preceded by acquiring ethical approval from the related institutional ethics committee.

Data Analysis

The Statistical Package of Social Sciences was used to enter and analyze the data. Demographic characteristics and the level of smartphone dependency, digital amnesia, and patient care quality were summarized using descriptive statistics, such as frequencies, percentages, means, and standard deviations. The hypotheses of the study were tested by using inferential statistics. Pearson correlation coefficient was applied to determine the relationship between smartphone dependency and digital amnesia, as well as between digital amnesia and patient care quality (Field, 2018). To study the predictive value of smartphone dependency and digital amnesia on the quality of patient care, multiple regression analysis was performed. The comparison between the level of digital amnesia in various hospital departments was done through analysis of variance. The p-value of less than 0.05 was used as statistical significance (Polit & Beck, 2021).

4. RESULTS

Demographic Characteristics of the participants.

One hundred young registered nurses were involved in the study. Most of the participants fell in the age group of 21 to 30 years, with a smaller percentage falling in the 31 to 35 years bracket. All the respondents were female. On the aspect of the educational qualification, the majority of the respondents had a Bachelor of Science in Nursing degree, with a few having a diploma or postgraduate qualification. Regarding clinical experience, the participants indicated different durations of work experience, with a majority of them having one to five years of work experience.

TABLE 4.1

Demographic Characteristics of Participants (N = 100)

Variable	Category	Frequency (f)	Percentage (%)
Age	21–25 years	42	42.0
	26–30 years	38	38.0
	31–35 years	20	20.0
Gender	Female	100	100.0
Education	Diploma in Nursing	28	28.0
	BS Nursing	60	60.0
	Post RN / MSN	12	12.0
Experience	1–3 years	46	46.0

	4–6 years	34	34.0
	>6 years	20	20.0
Department	Medical ward	28	28.0
	Surgical ward	24	24.0
	ICU	26	26.0
	Emergency	22	22.0

Smartphone Dependency Level

The descriptive analysis showed that the participants were mostly dependent on their smartphones. The general mean of the smartphone dependency implied that there was moderate to high dependency among young nurses. The number of people who frequent the use smartphones during their working hours in both professional and personal affairs was quite high. Most respondents admitted to using their phones several times in a shift and some said that they had been anxious or uncomfortable when they could not use their smartphones. The findings reveal that smartphones are an important aspect of the lives of young nurses in tertiary care hospitals.

TABLE 4.2

Descriptive Statistics of Study Variables (N = 100)

Variable	Mean	Standard Deviation
Smartphone Dependency	3.62	0.71
Digital Amnesia	3.48	0.69
Patient Care Quality	3.21	0.65

Digital Amnesia

Digital amnesia analysis showed that the level of dependence on digital devices by the participants in performing memory-related activities was moderate. The overall score of the digital amnesia indicated that a good number of nurses tended to save clinical information on their smartphones instead of remembering it by heart. Many of the participants have said that they had problems remembering drug dosages or clinical guidelines, or information about patients, without referring to digital sources. These results suggest that digital devices have already become a significant external memory support for young nurses, which could decrease the use of internal memory processes.

Correlation of Smartphone Dependency and Digital Amnesia

The Pearson correlation analysis indicated that there was a statistically significant positive correlation between the dependent variable of smartphone dependency and the dependent variable of digital amnesia. The higher the level of smartphone dependency reported by the nurses, the higher the level of digital amnesia was likely to be. This result confirms the first hypothesis of the study, which was that the more a person is addicted to the smartphone, the more they would experience digital amnesia. The value of the correlation implied the existence of a moderate relation, which meant that the more nurses are dependent on smartphones, the more they are likely to be dependent on digital storage as a memory source.

TABLE 4.3

Pearson Correlation between Smartphone Dependency and Digital Amnesia

Variables	r	p-value
Smartphone Dependency – Digital Amnesia	0.56	< .001

Effects of Digital Amnesia on Patient Care

Correlation analysis also indicated that there is a statistically significant negative correlation between patient care quality and digital amnesia. The increased digital amnesia was linked to the low self-reported performance of patient care and the lack of confidence in clinical decision-making. The nurses who were more dependent on smartphones to remember clinical information stated that they were more likely to be unable to make fast decisions in case of an emergency and had a lower level of confidence in their clinical judgments. This result confirms the second hypothesis that the increased digital amnesia would be linked with the reduction of the perceived quality of patient care.

TABLE 4.4

Pearson Correlation between Digital Amnesia and Patient Care Quality

Variables	r	p-value
Digital Amnesia – Patient Care Quality	-0.47	< .001

Prognostic Value of Smartphone Addiction and Internet Lobotomy

The analysis performed through multiple regression was aimed at determining the potential of smartphone dependency and digital amnesia to predict the quality of patient care. The model was statistically significant, meaning that the independent variables had a significant percentage of variance in patient care outcomes. Digital amnesia turned out to be a serious negative predictor of the quality of patient care, and smartphone dependency was indirectly associated with that of digital amnesia. This implies that smartphone dependence is a factor that leads to the diminished quality of patient care, mainly because it leads to digital amnesia and not directly. They are also in line with the postulated conceptual framework, where digital amnesia is a mediating variable between smartphone dependency and patient care.

TABLE 4.5

Multiple Regression Analysis Predicting Patient Care Quality (N = 100)

Predictor	B	SE	β	t	p
Constant	4.62	0.31	—	14.90	< .001
Smartphone Dependency	-0.18	0.07	-0.21	-2.57	.012
Digital Amnesia	-0.34	0.06	-0.43	-5.66	< .001

Comparison of Digital Amnesia across Hospital Departments

TABLE 4.6

One-Way ANOVA of Digital Amnesia by Department

Source of Variation	Sum of Squares	df	Mean Square	F	p
Between Groups	4.21	3	1.40	5.87	.001
Within Groups	22.88	96	0.24		
Total	27.09	99			

The analysis of variance was conducted one way to compare the levels of digital amnesia in nurses who have worked in various departments. The findings showed a statistically significant difference between the scores of digital amnesias in the clinical areas. Digital amnesia was reported to be higher in the case of nurses who worked in the intensive care units and emergency departments than in the case of nurses who worked in the medical and surgical wards. This observation can be explained by the fact that the workload and the demand to make quick decisions in the critical care settings promote increased use of smartphones as a means of obtaining information instantly.

Years of Experience, Smartphone Dependency and Digital Amnesia

Additional discussion was done on the role of years of nursing experience on smartphone addiction and digital amnesia. Nurses who had less clinical experience claimed to be more addicted to the smartphone and digitally amnesic than those with more years of work experience. It implies that new nurses will tend to experience the use of digital devices to memorize and get clinical advice more, whereas older nurses might have to rely on their inner knowledge and professional judgment.

Summary of Findings

The results of the research prove that the problem of smartphone addiction and digital forgetting is common among young nurses in tertiary care hospitals in Pakistan. The smartphone dependency and digital amnesia had a significant positive correlation, whereas digital amnesia had a negative correlation with patient care quality and clinical decision-making. It was observed that digital amnesia is one of the most important predictors of low patient care performance, which can be used to support the mediating role of smartphone dependency in the connection between it and patient care. The disparities in digital amnesia were noted among the hospital departments and experience, which means that the work environment and professional maturity contribute to the dependence on digital technology. On the whole, the findings have brought to the fore the cognitive and clinical consequences of excessive smartphone use among young nurses and the necessity of a balanced approach to the use of the digital tool in nursing practice.

5. DISCUSSION

The current study investigated the correlation of smartphone dependency, digital amnesia, and patient care in young nurses in tertiary care hospitals in Pakistan. The results confirmed that smartphone addiction was common among young nurses and it had a significant positive correlation with digital amnesia. Moreover, the patient care quality was negatively and significantly correlated with digital amnesia, which demonstrates that increased use of digital devices was connected with the worst perceived clinical performance and decision-making. Such results are valuable empirical data on the cognitive and clinical implications of overdependence on digital in the field of professional nursing activity.

Dependency on Smartphones in young nurses

The findings indicated that the smartphone dependency among young nurses is moderate to high, which is in line with the current research stating that health care workers become increasingly dependent on smartphones both in the workplace and personal life (Kim et al., 2019; O'Connor et al., 2020). The young nurses are especially susceptible to the habitual use of smartphones because of their heavy use of social media, messaging applications, and online clinical resources (Rozgonjuk et al., 2020).

The Pakistani scenario also implies that the growing access to the internet and the lack of a clear institutional policy on smartphone usage during working hours can also add to the dependency tendencies (Ahmed et al., 2021). The results of the previous studies on the topic of smartphone addiction among Pakistani nursing students indicated a high rate of smartphone addiction in relation to poor concentration and academic performance (Khan et al., 2020; Riaz et al., 2022). The current investigation builds on these results by showing that smartphone addiction is also high among working nurses, which implies that the behavior continues even after academic education and goes into the medical setting.

Correlation of Smartphone Dependency and Digital Amnesia

The high positive dependence between the reliance on smartphones and the digital amnesia was among the key findings of the present study. More levels of digital amnesia were also reported by the nurses who were more addicted to using smartphones. This fact is consistent with the cognitive offloading theory, according to which individuals prefer to save the

information in the external digital storage system, rather than in the internal memory system, as it is accessible (Storm and Stone, 2015; Barr et al., 2021).

Recent research found out that frequent smartphone use damages the encoding of information that forms weaker memory representations and reduces the capacity to remember information (Sparrow et al., 2016; Firth et al., 2019). The trend of cognitive outsourcing has the potential to erode the independent clinical judgment in the nursing practice where the speed of accessing drug dosage, emergency procedures and patient history is paramount.

The present findings align with the international studies indicating that excessive amounts of digital dependence are the predictors of the impaired working memory and attention control (Wilmer et al., 2017; Hadar et al., 2020). Nurse who has the habit of relying on smartphones as the primary source of information may eventually lose faith in the knowledge base that they possess, which serves as a vicious cycle whereby technology replaces internal thinking (Risko & Gilbert, 2016). This relation shows the intellectual risks of being unable to control smartphone use in high-responsibility professions such as nursing.

Digital Amnesia and Quality of Patient Care

The study further determined that digital amnesia and quality of patient care were negatively correlated significantly. Nurses who had higher scores in digital amnesia said that they perceived lower quality of care and effectiveness in clinical decision-making. The theoretical consistency of this result is that the cognitive load theory states that the reduction in the internal knowledge storage results in increased mental workload and reduced performance efficiency (Sweller et al., 2019).

The areas of clinical decision-making that are of importance include rapidly accessed stored knowledge, pattern recognition, and experiential memory (Nibbelink and Brewer, 2018). The situation with nurses relying on smartphones to retrieve even basic clinical information can expose the nurses to the risk of not being able to act on their own in case of an emergency. As it has been determined in the past research, the primary causes of the threat of medication errors and delayed interventions are memory failure and divided attention (Westbrook et al., 2018; Johnson et al., 2020).

The potential of adverse effect of digital amnesia on nurse-patient interaction is also possible. The patients expect nurses to be competent, attentive and confident. The frequent use of smartphones may be regarded as unprofessional or irresponsible, and this may reduce the degree of patient trust and satisfaction (McBride et al., 2019; Cho and Lee, 2021). This confirms the results of the present study that the higher the digital amnesia, the lower the perceived quality of patient care.

Differences in Departmental Digital Amnesia

The findings also showed that significant differences existed in digital amnesia across different departments in the hospital with nurses in the intensive care unit and emergency unit reporting a higher rate of amnesia as compared to the medical and surgical units. This may be explained by the fact that the critical care environments are defined by the higher cognitive loads and time pressure (Carayon et al., 2020).

Digital monitoring systems, drug databases, and clinical calculators, which are frequently utilized by ICU and emergency nurses, can become unintentionally used to encourage habitual cognitive offloading (Topaz et al., 2016). In the long run, active memory use and digital amnesia could grow due to the constant use of these tools. The same outcomes have been demonstrated in the research that suggests that clinics with a high level of technological use are linked with a higher degree of dependence on digital resources and lower self-recall (Fitzpatrick et al., 2020; Alshammari et al., 2022).

Connection with Theoretical Framework

The results of this research are in line with the presented conceptual framework, according to which smartphone dependency is the predictor of the digital amnesia that eventually influences the quality of patient care. Metacognitively, nurses can be less conscious about their growing dependency on external memory aids, which results in less self-observation and confidence in digital aids (Schraw and Dennison, 2018).

The self-regulated learning theory focuses on active reflections and personal knowledge building (Zimmerman, 2017). The overuse of smartphones can interfere with this process by substituting the deep learning process with that of surface-level information retrieval. Likewise, the cognitive load theory describes how excessive use of digital devices leads to the overload of extraneous cognitive loads, which, in turn, worsens critical thinking and decision-making (Sweller et al., 2019). These theoretical assumptions have been empirically confirmed in the nursing setting by the current findings.

Nursing Practice and Education Implications

The implications of these findings are significant to the nursing practice, education, and policy in hospitals. Although smartphones are useful in gaining clinical information, their unregulated usage can be a contributor to cognitive dependency and clinical incompetence. Nursing professionals must include the training of mindful technology use, clinical memory enhancement, and metacognitive awareness in the curricula (Firth et al., 2019; Cho and Lee, 2021).

To reduce distraction and guarantee patient safety, hospital administrators ought to come up with clear instructions about how smartphones should be used during clinical duty hours (Westbrook et al., 2018). The effects of digital amnesia can be reversed with the help of in-service training programs that should address the issues of clinical reasoning, independent decision-making, and memory reinforcement strategies (Nibbelink and Brewer, 2018).

Strengths and Limitations

The main strength of the research is that it is one of the first studies in Pakistan that explores the digital amnesia in working nurses and its relationship with smartphone addiction and patient care. The study was however founded on self-reported statistics which are likely to be affected by social desirability bias. Further, the causal inference is limited by the cross-sectional research design. Longitudinal studies should be carried out to identify how the long-term usage of smartphones affects cognitive functioning and clinical performance (Wilmer et al., 2017).

Conclusion of Discussion

In conclusion, the present study provides sufficient support to the idea that smartphone addiction is closely interconnected with the issue of the digital amnesia among young nurses and that the latter negatively impacts the quality of patient care and the quality of clinical decision-making. These findings represent a novel cognitive threat that is being introduced in the modern nursing practice that should be considered. A safe, effective, and patient-centered nursing care in the technologically transforming healthcare systems requires the combination of digital technology and strategies intended to maintain internal cognitive abilities.

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