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AN EMPIRICAL INVESTIGATION OF NURSE RETENTION THROUGH INTEGRATING QUALITY OF NURSES WORK-LIFE, HRM PRACTICES, EMPLOYEE HAPPINESS, AND ELECTRONIC HEALTH RECORD SYSTEM AMONG JORDANIAN NURSES

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Abstract
This study aimed to investigate the impact of the quality of nurse work retention and HRM practices on nurse retention in the mediation role of employee happiness while moderating the role of the electronic health record system. This study used two theories: sociotechnical systems and social exchange. The data were collected from 419 nurses of public and university hospitals in Jordan. The collected data was analysed through the structural equation modeling technique by using SmartPLS 3.0. The findings reveal that both QNWL and HRM practices positively impact nurse retention. Also, the mediation role of employee happiness between HRM practices and nurse retention is significant. However, the positive impact of performance appraisal on nurse retention is not supported. Also, the moderating role of EHRS on the relationship of QNWL and nurse retention is not supported. This study provides theoretical and practical insights regarding improving nurse retention and offers a comprehensive framework for healthcare institutions.

Research Paper

Keywords: Nurse retention, quality of nurse work life (QNWL), HRM practices, employee happiness, electronic health record system, Jordan

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Introduction

Nurse retention is a global challenge that affects the quality of healthcare, organizational performance, and financial outcomes (Peng et al., 2023). According to the World Health Organization (2024), an additional 4.5 million nurses will be needed globally by 2030 in order to meet healthcare demands. Importantly, the report noted that the shortages will more likely be occurring in these regions. However, according to the estimate of International Council of Nurses (2021), the additional nurses needed would be around 10.6 million by 2030. High nurse turnover rates lead to disruptions in healthcare services, especially in low- and middle-income countries like Jordan (Cardiff et al., 2023). Jordan's healthcare sector is facing a critical shortage of nurses, especially in public and university hospitals (Salahat & Al-Hamdan, 2022). This shortage arises due to poor working conditions, low salaries, limited career advancement opportunities, and growing demand for healthcare services (Albsoul et al., 2023; Khrais et al., 2023).

Many previous authors studied good or bad Quality of Nursing Work Life (QNWL) as the main cause behind retention or turnover, respectively (Kaddourah et al., 2018; Lee et al., 2015; Parveen et al., 2017). QNWL includes four major dimensions, including work-life, work context, work design, and work world. These dimensions directly affect the job satisfaction and retention of nurses (Brooks & Anderson, 2005). However, despite the current evidence of QNWL and retention (Parveen et al., 2017), the findings of previous studies remain inconclusive. Also, existing evidence shows that other factors like Human Resource Management (HRM) practices also play a

critical role in retaining employees in any organization, especially in healthcare (Halid et al., 2024; Johari et al., 2019).

In addition, the QNWL does not cover the specific measurement of performance appraisal and training programs in addition to recruitment and selection as well as compensation (Kaddourah et al., 2018; Srirangam Ramaprasad et al., 2018). Therefore, the researchers who solely rely on the QNWL framework of Sociotechnical Systems (STS) theory often ignore the significant role of HRM practices in retention. Also, the existing studies do not provide empirical evidence regarding the role of the multidimensional construct of HRM practices in nurse retention, especially in Jordanian public and private hospitals (Gharaibeh, 2024). Therefore, we argue that combining Social Exchange Theory (SET) will provide a more holistic and comprehensive understanding as this theory is explicitly applied to HRM studies to highlight how retention can be achieved with the help of cost-benefit analysis (Cropanzano et al., 2017; Pham et al., 2023).

In addition to HRM practices, employee happiness is increasingly recognized as an important predictor of employee retention (Louis, 2023; Selvi & Madhavkumar, 2023). Kaur and Kaur (2024) asserted that happy employees show lower turnover intentions. Also, happiness is studied as a consequence of HRM practices (Choudhary & Kunte, 2023; Martínez-Falcó et al., 2024). Despite the growing recognition of the role of happiness in retention, there is no evidence to show the mediating effect of happiness between HRM practices and retention, especially in Jordanian Universities, which is also an important research gap. Moreover, in order to reduce the burden on nurses and enhance the effectiveness of quality of working life, the role of Electronic

Health Record Systems (EHRS) is significant (Kutney-Lee et al., 2021). However, they require training and may introduce potential disruptions to workflow (Coughlin et al., 2022). Therefore, the integration of HRM practices along with EHRS is important.

Based on the above research gaps, this study aims to investigate the combined impact of QNWL and HRM practices on nurse retention in Jordanian public and university hospitals. It also aimed to examine the mediating role of employee happiness between HRM practices and nurse retention. Importantly, the moderating role of EHRS in the relationship between QNWL and employee retention is examined. With the help of STS theory and SET, this study provides a holistic framework for understanding the factors influencing nurse retention.

Review of Literature

Overview of Quality of Nursing Work Life (QNWL)

QNWL is a multifaceted concept that significantly impacts both individual nurse well-being and broader organizational outcomes. It includes various elements such as job satisfaction, work-life balance, and personal fulfillment. These elements are essential for achieving organizational goals and improving the overall quality of care (Alharbi et al., 2019; Uysal & Sirgy, 2019). Studies suggest that when QNWL is elevated, it not only decreases burnout but also enhances organizational commitment, which results in better job performance and patient outcomes (Abbasi et al., 2017; Morsy & Sabra, 2015). This is particularly critical in healthcare as nurses' dedication directly affects the quality of patient care and overall hospital efficiency.

Apart from the above, Maf'ula et al. (2020) asserted that QNWL serves as a buffer against the stress and emotional demands inherent in the nursing profession. Salahat and Al-Hamdan (2022) noted that better work-life quality helps in reducing turnover intentions. Global healthcare systems are immensely facing this issue of turnover intensions. Particularly, it is prominent in developing countries like Jordan, where nurse shortages are a pressing concern (Salahat & Al-Hamdan, 2022). Furthermore, the role of QNWL in promoting organizational commitment cannot be understated. For instance, Salahat and Al-Hamdan (2022) noted that QNWL promotes job satisfaction among nurses, which leads to their retention. However, Gharaibeh (2024) asserted that the effectiveness of QNWL depends on its holistic implementation. A fragmented approach that focuses solely on one aspect without addressing other critical factors (such as professional development and workload) can limit its overall impact (Parveen et al., 2017). Therefore, organizations need to adopt a comprehensive view of QNWL that integrates both personal and professional aspects of a nurse's work life. Additionally, these organizations must ensure a balanced and supportive work environment that not only enhances job performance but also retains skilled nursing staff (Alzahrani, 2022; Rodríguez-Sánchez et al., 2020).

Overview of Human Resource Management Practices

Paauwe and Boon (2018) highlighted the crucial role of HRM in promoting an effective workforce by managing those employee-related processes that extend beyond traditional contractual relations. Core HRM prac-

tices, including recruitment, training, performance appraisal, and compensation, are essential in attracting and retaining talent. Also, these practices are significant in ensuring that employees are engaged and motivated to contribute to organizational success (Kalyanamitra et al., 2020). Chukwuka and Nwakoby (2018) noted that properly implemented HRM activities provide a structured framework for improving job satisfaction, employee development, and productivity. These job outcomes are critical in healthcare where the retention of nurses is a key challenge (Cho & Wee, 2023).

Apart from the above, Kalia et al. (2023) noted that effective HRM practices are significant for enhancing organizational efficiency while reducing employee turnover. For instance, comprehensive training programs equip employees with the necessary skills to perform their duties effectively. On the other hand, fair as well as transparent performance appraisals can boost morale which leads to higher performance (Manzoor et al., 2019). Furthermore, competitive compensation packages are the strong incentives that retain employees. In this way, organizations can reduce the financial and operational burdens that arise due to high turnover (Salamzadeh et al., 2014; Elsafty & Ragheb, 2020). However, it is not enough to just implement these practices. These organizations need to ensure that HRM activities are aligned with strategic objectives. It is important to note that a fragmented approach regarding HRM may fail to deliver the anticipated outcomes. As an alternative, organizations need to integrate HRM practices into the organizational culture. This process will lead to improved employee engagement, job satisfaction, and long-term retention (Bibi et al., 2018; Boohene & Asuinura, 2011; Liana Qatamin, 2023). In healthcare, where employee well-being directly impacts

patient outcomes, HRM practices must also focus on reducing burnout and promoting work-life balance to ensure both the well-being of staff and the efficiency of healthcare delivery systems.

Underpinning Theories

Sociotechnical Systems (STS)Theory

STS theory emerged in the 1950s. It was introduced by researchers from the Tavistock Institute, including Eric Trist. This theory was developed in order to understand the interaction of social and technical elements within organizations (Emery & Bamforth, 1951). The theory highlights the need for a balanced alignment between social components and technical factors to create an optimal work environment. Social components may include human interactions, job satisfaction, etc. However, technical factors may include tools, systems, and resource availability (Hirt et al., 2020; Sony & Naik, 2020). This theory is particularly effective in the healthcare sector. Especially it helps in understanding the QNWL as the balance between social and technical factors significantly impacts job satisfaction and nurse retention (Davoodi et al., 2020).

The four dimensions of QNWL, as mentioned above, can be explained through the STS framework. Initially, O'Brien-Pallas and Baumann (1992) proposed a unifying framework for incorporating these four dimensions. Guest et al. (2022) noted that these dimensions summarize the complex relationship between social and technical aspects within nursing environments. For instance, the nature of nurses' clinical settings and their ability to manage both work and personal life affect their work life balance (Kowitlawkul et al.,

2019; Kwak & Kim, 2021). Apart from the above, Work design (how tasks are structured) and work context (the organizational climate) are also essential components of QNWL that affect nurse retention (Kaddourah et al., 2018).

From the lens of STS theory, imbalances between social and technical elements can lead to job dissatisfaction. This lack of satisfaction enhances the turnover intentions among nurses (Wang et al., 2020). In this research model, the use of EHRS as a moderator between QNWL and nurse retention is also explained by STS. EHRS is considered a technical component. This component can either ease or exacerbate nurses' work-life quality. This situation depends on the usability of EHRS. Also, its effectiveness depends upon the support provided for its adoption (Khairat et al., 2020). In short, if nurses have such efficient technical tools (e.g. EHRS) as well as social support of the organization, they will not leave their organizations. While STS addresses the alignment of technical and social work environments, SET complements this by focusing on the relational dynamics between organizations and employees, providing a dual perspective that links structural conditions with motivational outcomes.

Social Exchange Theory (SET)

Social exchange theory was first published in a book by Blau (1964). According to this theory, relationships within organizations are based on reciprocal exchanges of resources. The individuals continually assess the benefits and costs of remaining in these relationships (Blau, 2017). From the lens of SET, we can explain how employees' perceptions of organizational support

influence their retention or turnover (Harden et al., 2018). When employees perceive that their efforts are rewarded, they are more likely to reciprocate with a commitment to the organization (Cuevas, 2023).

HRM practices align well with the principles of SET. For instance, Jun and Eckardt (2023) found that training programs offer the opportunity for employees to improve their skills. The employees reciprocate this opportunity with their dedication and retention. Similarly, employees' trust can be built through a fair and transparent performance appraisal system (Rufino, 2023). Such trust increases the chances of employee retention (Taneja et al., 2024). Furthermore, Johari et al. (2019) asserted that compensation (both monetary and non-monetary) motivates individuals to stay loyal and committed.

Apart from the above, SET is also used to explain the mediation role of employees' happiness between HRM practices and nurse retention. From the lens of SET, Cropanzano et al. (2017) noted that happy employees are more engaged and satisfied with their roles as compared to those employees who are not happy. Therefore, happy employees are more likely to stay in the organization (Kaur & Kaur, 2024). Employee happiness strengthens the relationship between HRM practices and retention. Bahadır et al. (2024) stated that happier employees perceive greater organizational support, and Sindhanaichelvi and Gayathri (2024) asserted that these happy employees are more likely to stay in the organizations.

The Direct Relationship Between Quality of Nurses' Work Life and Nurse Retention

The relationship between the QNWL and nurse retention is a critical area of focus in the healthcare sector, particularly as the industry faces increasing challenges in retaining skilled staff (Ed-Dafali et al., 2023). The STS theory offers a comprehensive framework for understanding how social and technical factors in healthcare environments influence nurse retention (Kim et al., 2020). According to STS theory, an organization that successfully integrates both social and technical aspects into its work environment is more likely to promote higher levels of job satisfaction, leading to improved retention rates. QNWL is typically broken down into four dimensions: work-life/home-life balance, work design, work context, and work world, each of which significantly influences nurse retention (Brooks & Anderson, 2005).

The work-life/home-life dimension is particularly important in healthcare, where demanding work schedules can severely disrupt personal lives. Research shows that a poor balance between work and home life can lead to burnout, dissatisfaction, and an increased likelihood of nurses leaving their positions (Mohamed Elshahat et al., 2019; Rahman et al., 2024). For example, rotating shifts and long hours make it challenging for nurses to manage personal responsibilities, leading to higher stress levels and job dissatisfaction. Conversely, provisions like on-site childcare or flexible scheduling can mitigate these challenges and enhance retention (Davoodi et al., 2020). Thus, it can be posited that improving the work-life/home-life balance significantly strengthens nurse retention, especially in settings where personal and professional lives are often in conflict.

Work design, which includes elements like job autonomy, workload, and the physical environment, is another critical factor influencing nurse retention. High workloads and stressful environments reduce productivity and increase turnover intentions (Almalki et al., 2012). However, job autonomy, where nurses can make informed decisions and exercise clinical judgment, has been shown to boost job satisfaction and, consequently, retention (Jedwab et al., 2022). Nurses who are empowered with autonomy are more likely to remain committed to their organizations, as they feel trusted and valued. This highlights the importance of fostering a work environment that balances workloads and grants nurses sufficient autonomy, thereby enhancing retention.

The work context, involving management practices, peer relationships, and opportunities for professional growth, also has a profound impact on nurse retention. Poor management and inadequate communication are often cited as reasons for job dissatisfaction and intentions to leave (Begat et al., 2005). On the other hand, supportive management, positive peer relationships, and clear avenues for professional development create a conducive environment that encourages nurses to stay (Decker & Shellenbarger, 2012). Opportunities for career progression, mentorship, and continuous learning are essential in fostering job satisfaction and long-term commitment. Without these opportunities, nurses may feel stagnant and seek better prospects elsewhere (Poku et al., 2022).

Lastly, the work world dimension, which includes intrinsic motivation, job satisfaction, and external rewards like salary and benefits, plays a

key role in retention. Nurses often expect that as they gain expertise and contribute more to their organizations, they will be financially rewarded (Agus & Selvaraj, 2020). When these expectations are unmet, they are likely to explore alternative opportunities with better compensation and benefits. Furthermore, fringe benefits like health insurance, retirement plans, and educational sponsorship significantly influence retention decisions, as they contribute to a sense of security and value within the organization (Almalki et al., 2012). Overall, the literature provides strong evidence that improving QNWL can lead to better retention outcomes. Institutions that prioritize elements such as work-life balance, job autonomy, professional development, and competitive compensation are more likely to retain their nursing workforce (Pio & Lengkong, 2020). Conversely, organizations that fail to address these areas experience higher rates of attrition (Zhao et al., 2022). Hence, based on the above discussion and theoretical base, the following hypotheses are developed.

H1: *There is a positive impact of the quality of nurse work-life on nurse retention in Jordanian public and university hospitals.*

H1a: *There is a positive impact of work life/home life on nurse retention in Jordanian public and university hospitals.*

H1b: *There is a positive impact of the work design on nurse retention in Jordanian public and university hospitals.*

H1c: *There is a positive impact of the work context on nurse retention in Jordanian public and university hospitals.*

H1d: *There is a positive impact of the work world on nurse retention in Jordanian public and university hospitals.*

The Direct Relationship Between HRM Practices and Nurse Retention

HRM practices have been widely recognized as critical determinants of employee retention, especially in healthcare (Mansour, 2024). In addition, Owolabi et al. (2024) found that effective HRM practices promote employee commitment and reduce turnover rates. Also, these practices are not fully captured in models like the QNWL (Gharaibeh, 2024). Therefore, these practices are essential for creating an environment to make employees feel valued, supported, and motivated to stay. In the context of Jordanian public and university hospitals, challenges appear regarding nurse shortages and high turnover (Salahat & Al-Hamdan, 2022). Therefore, the role of these HRM practices in retaining nurses is particularly critical.

Training and development are the basic HRM practices that mostly lead to retention of nurses by enhancing their skills and career prospects (Alrazehi & Amirah, 2020). Dixit and Sinha (2020) noted that the organizations that invest in their training and development programs, their employees are confident, competent, and committed to the organization. Also, Rawashdeh and Tamimi (2020) found that Jordanian nurses' perceptions of sufficient training opportunities increase their job satisfaction while reducing turnover intentions. Furthermore, Adams et al. (2021) found that nurses' training not only helps them in enhancing their skills but also produce multiple opportunities for their professional growth.

Apart from the above, other HRM practices like recruitment and selection are significant in deciding whether the right persons are selected for the right jobs. This accurate selection also matches the skills of employees

with the needs of the organizations; therefore, there are fewer chances of turnover (Abdalla Hamza et al., 2021). Moreover, organizations can reduce the risk of turnover through an effective and strict selection process, as mismatching between employees' skills and organizational needs can lead to turnover (Alrazehi & Amirah, 2020; Fletcher et al., 2018; Kalyanamitra et al., 2020). In addition, Abbasi et al. (2022) also found that a structured recruitment and selection process leads to less turnover; therefore, business growth is also positively effected as employees are continuously focused on their work goals. Performance appraisal, another critical HRM practice, effectively helps reduce the turnover rate as this practice provides feedback that helps employees to understand their contributions and areas for improvement (Upadhyay et al., 2020). From the lens of SET, fair and transparent performance evaluations enhance employees' commitment to the organization. Due to this fair recognition, they feel valued for their efforts (Kalyanamitra et al., 2020). In healthcare, job performance is directly linked with patient outcomes; therefore, a fair appraisal system is necessary for high morale among nurses. Memon et al. (2020) noted that performance appraisal is not only used for evaluating job performance but also a means for employees' development and further career opportunities.

Apart from the above, the fourth dimension of HRM practices, namely compensation and benefits, is used for employee retention (Abou-Moghli, 2019; Kalyanamitra et al., 2020). These compensations involve both monetary and non-monetary rewards (Sutanto et al., 2023). In the lens of SET, Xuecheng et al. (2022) highlighted the significance of fair compensation and

rewards and noted that fair compensation leads to a high likelihood of employee retention. Also, Aman-Ullah et al. (2020) noted that fair compensation also creates a sense of reciprocity and loyalty among employees. With respect to the healthcare sector, Patiar and Wang (2020) noted that good salaries with additional benefits like health and retirement plans positively influence the intention of nurses to stay in the organization. Moreover, Aman-Ullah et al. (2020) reaffirm the role of compensation in reducing turnover. From the above discussion and evidence, it can be concluded that the relationship between HRM practices and nurse retention is justifiable and logical; therefore, the following hypotheses are developed.

H2: *There is a positive impact of HRM practices on nurse retention in Jordanian public and university hospitals.*

H2a: *There is a positive impact of training and development on nurse retention in Jordanian public and university hospitals.*

H2b: *There is a positive impact of recruitment and selection on nurse retention in Jordanian public and university hospitals.*

H2c: *There is a positive impact of performance appraisal on nurse retention in Jordanian public and university hospitals.*

H2d: *There is a positive impact of compensation and benefits on nurse retention in Jordanian public and university hospitals.*

The Mediation Role of Employee Happiness

The mediation role of employee happiness between HRM practices and nurse retention can be explained with the help of SET. García Contreras

et al. (2022) noted that effective HRM practices positively influence the happiness of employees. Huang et al. (2016) found that the happiness and satisfaction of employees lead to high retention rates. Similarly, many other studies confirm the positive relationship between employee happiness and retention (Hosseini et al., 2022, 2024). For instance, Roy and Konwar (2018) found that workplace happiness is the key to employees' retention. In addition, Sarwar et al. (2023) found that employee happiness leads to high job satisfaction, retention, and work performance.

Ahmed and Abdallah (2020) noted that healthcare workplaces have high levels of stress and burnout; therefore, such environments have significant employee happiness. In this regard, HRM practices that promote job satisfaction and professional growth are important for promoting happiness. Research has shown that nurses who feel happy and satisfied with their work environment are more likely to stay in their positions as they experience a sense of loyalty and well-being (Alserhan et al., 2021). From the above discussion, evidence, and theoretical base, it can be concluded that HRM practices promote happiness among nurses, which in turn leads to their intention to stay in the organization. Therefore, the following hypothesis is developed.

H3: *Employee happiness has a significant mediation role between HRM practices and nurse retention in Jordanian public and university hospitals.*

The Moderation Role of Electronic Health Record System

The moderating role of the EHRS in the relationship between QNWL and nurse retention can be explained through STS theory. According to this

theory, a balance between social (work environment, satisfaction) and technical (systems, tools) factors is necessary for organizational success (Emery & Bamforth, 1951). With respect to the healthcare sector, Melnick et al. (2021) noted that EHRS decreases the level of stress and burnout among nurses and helps increase their wellbeing. Khairat et al., (2020) asserted that effective use of EHRS improves workflow efficiency and job satisfaction in addition to reducing administrative burdens.

Empirical evidence highlights that EHRS contributes positively to nurse retention by mitigating stress and burnout (common issues in healthcare) (Kutney-Lee et al., 2019). Nurses who work with well-functioning EHRS are more likely to feel satisfied with their work environment. The reason behind this connection is that EHRS enables better patient care and reduces manual tasks (Moy et al., 2021). Conversely, poorly implemented EHRS can increase frustration and workload; therefore, they can negatively affect QNWL and retention (Melnick et al., 2020). Thus, EHRS can either strengthen or weaken the relationship between QNWL and retention. Such a relationship depends on its usability and implementation. Therefore, based on the discussion and theoretical base, the following hypothesis is developed.

H4: *EHRS moderates the relationship between the quality of nurses' work life and nurse retention, such that an increase in EHRS strengthens the relationship between the quality of nurses' work life and nurse retention in Jordanian public and university hospitals.*

Research Model

The research model of this study is developed on the basis of developed hypotheses and the two popular theories including STS and SET. The STS theory mainly addresses the relationship between QNWL and nurse retention. This theory highlights the importance of a balanced interaction between social and technical elements through promoting a positive work environment (Cao et al., 2024; Selsky & Babüroglu, 2023; Trixie et al., 2023). On the other hand, SET explains how the role of HRM practices to improve reciprocal relationships between organizations and employees leads to employee retention (Kalia et al., 2023; Pham et al., 2023).

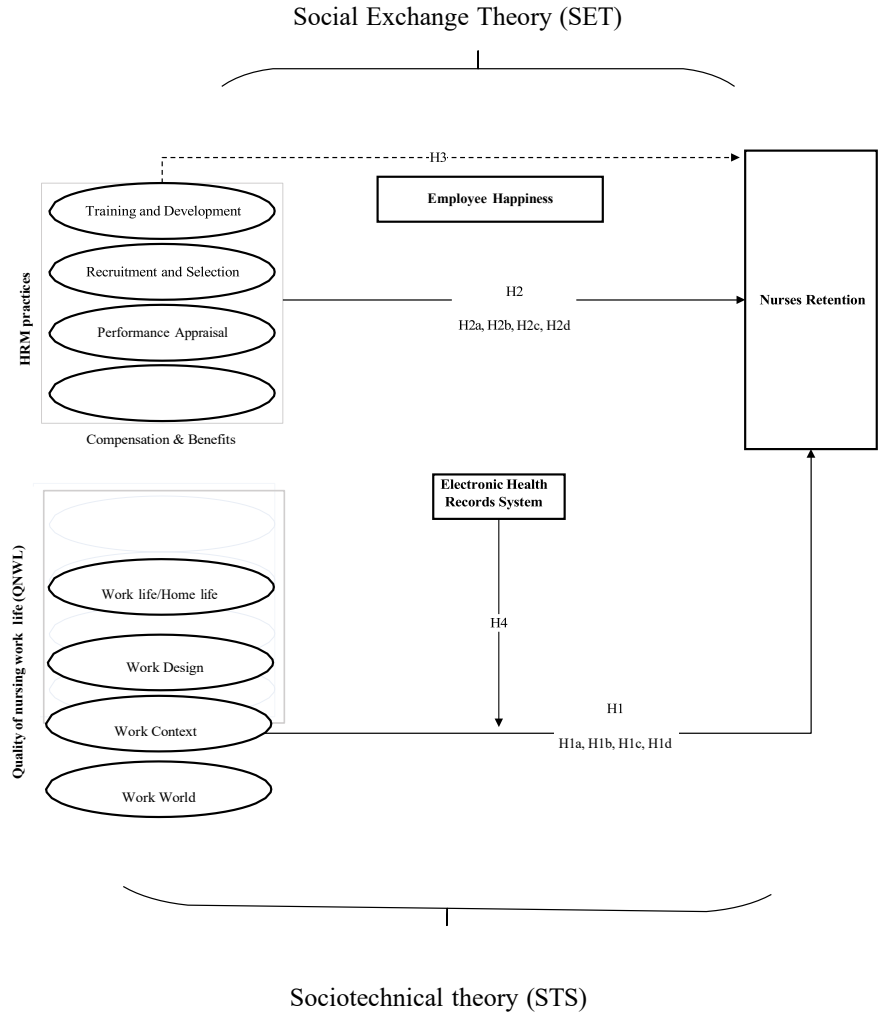

Figure 1. Research Model | *Source:* Author

In this study, QNWL and HRM practices are treated as composite constructs with four dimensions, each that are separately tested as independent variables (see figure 1). Together, these two sets of variables explain the

factors influencing nurse retention. To extend this model, this study introduces two additional constructs including employee happiness and EHRS. Employee happiness acts as a mediator between HRM practices and nurse retention, based on the understanding that happier employees are more committed and less likely to leave their jobs (Thompson & Bruk-Lee, 2021). Meanwhile, EHRS serves as a moderator between QNWL and nurse retention, as effective use of EHRS improves the effectiveness of QNWL on retention.

Research Methodology

Sample and Population

The target population for this study consists of registered nurses working in public and university hospitals in Jordan. These nurses are directly involved in providing bedside care, specifically in 24/7 inpatient units such as intensive care, emergency, and medical-surgical departments. Nurses in administrative roles or those working in outpatient clinics or operating rooms were excluded from the study. The choice of these departments is based on their high workload, stress levels, and shift work, which are crucial factors in studying nurse retention (BAE, 2024). There are currently 26,657 registered nurses in Jordan, and approximately 42% work in public and university hospitals (Nashwan et al., 2024). As this study focuses on public and university hospital nurses only; therefore, the total population becomes around 11,196 (46% of 26,657). A combination of purposive and convenience sampling techniques was employed. Purposive sampling was used to select hospitals and departments where nurses face higher workloads and stress, which are

critical factors for understanding nurse retention. Convenience sampling was then applied to recruit participants within these hospitals, where HR managers distributed the surveys to nurses who were available and willing to participate. For this study, hospitals with more than 200 beds, like Al Bashir Hospital, King Abdullah University Hospital, Jordan University Hospital, etc., were selected to ensure a diverse and representative sample. These hospitals were selected due to their high patient volume, diverse nursing workforce, and comprehensive departmental structures, which provide a more representative understanding of the challenges related to nurse retention in large-scale institutional settings. Using Krejcie and Morgan (1970) sample size table, a minimum sample size of 370 was required, but 419 nurses were ultimately surveyed to account for potential non-responses and ensure better representation.

Measurements

This study used established measurement scales for each variable. The QNWL scale, adapted from Brooks and Anderson (2005), comprises four dimensions: work-life/home-life balance, work design, work context, and work world, with a total of 42 items. HRM practices were measured using a scale from Fahim (2018). This scale measured four dimensions of HRM practices including training and development, recruitment and selection, performance appraisal, and compensation and benefits. Each of the four dimensions comprises 3 items. The Employee Happiness scale was adapted from Maleka et al. (2018). This scale included 9 items that measured emotional attachment and job satisfaction. In addition, nurse retention was measured by using a scale developed by Bibi et al. (2018). This scale included 11 items regarding

the assessment of commitment and future intentions of nurses. Finally, the Electronic Health Record System (EHRS) scale was adapted from Kutney-Lee et al. (2019). This scale included 9 items regarding usability and the impact of EHRS on nursing tasks. All scales were measured on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree."

Data Collection and Analysis

Data were collected through structured questionnaires. These questionnaires were distributed to HR managers in the selected hospitals. These HR managers provided the surveys to eligible nurses. Every respondent's participation was voluntary. Their anonymity was guaranteed to encourage honest responses. We gave one week to nurses in order to complete the surveys. The completed questionnaires were returned to the HR managers. After data collection, the surveys were carefully reviewed to exclude incomplete or hastily filled responses. The correct responses counted as 419, were finalized for data analysis. In this study, the researcher used a reflective-formative model.

This model was chosen due to its ability to cover complex and multidimensional constructs like QNWL and HRM practices. In this approach, latent variables are formed by their indicators. The changes in these dimensions can directly affect the construct (Hair Junior et al., 2014). Additionally, Diamantopoulos et al. (2008) asserted that formative models can better handle predictor variables, especially for indicators that may not necessarily be covary. The collected data were analyzed using Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) approach (Salamzadeh, 2021; Arbabi et al., 2022). For data analysis, the preliminary tests were applied in

SPSS 22 software, while the advanced SEM technique was applied by using SmartPLS 3.0. PLS-SEM is well-suited for complex models with multiple variables and relationships, as it allows for the estimation of both direct and indirect effects (Tanha et al., 2011; Fauzi, 2022).

Results and Discussion

Results

The frequency distribution of nurses' demographic characteristics is presented in table 1. This table shows that most respondents are female (63.2%) and under the age of 30 (49.9%). The majority of respondents hold a diploma (61%) and have less than one year of work experience (51.6%). More than 70% of respondents are unmarried, while the majority of the participants (71.8%) earn less than 500 JD per month. These figures highlight a relatively young, less experienced, and mostly female workforce in Jordanian public and university hospitals.

Table 1. Demographic Profile

		Frequency	Percent
Gender	Male	154	36.8
	Female	265	63.2
	Total	419	100.0
Age	<30 years	209	49.9
	31-40 years	147	35.1
	41-50 years	36	8.6
	>50 years	27	6.4
	Total	419	100.0
Qualification	Diploma	258	61
	Bachelor's degree	144	34.4
	Postgraduate	17	4.1
	Total	419	100.0
Experience	<1 year	216	51.6
	1-5 years	136	32.5
	5-10 years	54	12.9

		Frequency	Percent
	>10 years	13	3.1
	Total	419	100.0
Marital Status	Unmarried	296	70.6
	Married	105	25.1
	Others	18	4.3
	Total	419	100.0
Monthly Income	Less than 500 JD	301	71.8
	More than 500 JD	118	28.2
	Total	419	100.0

Descriptive statistics are primarily used for summarized form of results. Table 2 shows descriptive statistics (mean and standard deviation) and normality statistics (skewness and kurtosis). Cooksey and Cooksey (2020) noted that mean values represent the average value, while the standard deviation shows data variation from the mean values. For normality, skewness should be between -1 and +1, while the kurtosis should be between -3 and +3 (Hair Jr et al., 2019). Table 2 shows that all the variables' skewness and kurtosis values fall within acceptable ranges. Therefore, the table shows that the data distribution is approximately normal.

Table 2. Descriptive Statistics

Variable Names	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Work Life	2.9342	.79275	-.014	.119	-.505	.238
Work Design	2.9630	.78639	-.055	.119	-.584	.238
Work Context	2.9341	.78337	-.069	.119	-.610	.238
Work World	2.9666	.81823	-.079	.119	-.555	.238
Training and Development	2.9204	.86857	.036	.119	-.499	.238
Compensation and Benefits	2.9220	.85515	-.105	.119	-.568	.238
Performance Appraisal	2.9507	.86315	-.042	.119	-.515	.238
Recruitment and Selection	2.9109	.83103	.018	.119	-.467	.238
Employee Retention	2.9651	.78444	-.144	.119	-.658	.238
Employee Happiness	2.9512	.80438	-.070	.119	-.535	.238
Electronic Health Record System	2.9329	.79828	-.055	.119	-.667	.238
Valid N (listwise)						

In order to deal with the reflective formative model, we used a two-stage approach in SEM. Figure 2 shows the first model (outer model) in which all the constructs are taken as first order and reflective. Figure 3 shows the second stage measurement model (inner model), which includes QNWL and HRM practices as formative constructs. The details and process of structural model assessment are shown in figure 4 and explained below.

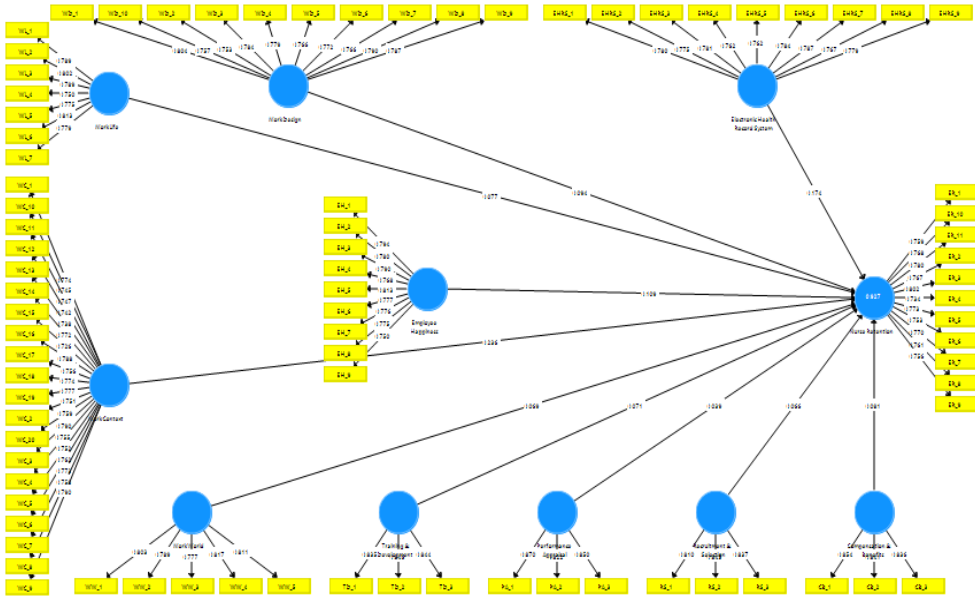

Figure 2. Measurement Model 1

Table 3 shows the construct reliability and validity for model 1. First, factor loadings represent the correlation between observed indicators and their underlying latent variables. According to Hair et al. (2014), loadings should ideally be above 0.70; however, values as low as 0.50 can be acceptable. In Table 3, the factor loadings for all items range from 0.726 to 0.870. These values show that they are above the minimum suggested threshold. Therefore, factor loadings are sufficient, and there is no need to remove any

item. Secondly, Tables 3 and 6 show the values of the variance inflation factor (VIF) to measure the multicollinearity between indicators. The majority of the researchers state that the VIF values should be below 5 (O'brien, 2007), while some other authors accept VIF values between 5 and 10 (Hair et al., 2010; Kutner et al., 2005; Marquardt, 1970). In table 3, all VIF values are below the threshold of 5, ranging from 1.469 to 2.515. For model 2, table 6 shows that all the values are below 10. Therefore, both tables show that there is no issue with multicollinearity.

Table 3. Construct Reliability and Validity (Model 1)

Variable and Item Names	Loadings	VIF	Cronbach's Alpha	CR	AVE
Work Life			0.896	0.919	0.617
WL1	0.789	2.003			
WL2	0.802	2.077			
WL3	0.789	1.996			
WL4	0.750	1.775			
WL5	0.775	1.901			
WL6	0.813	2.162			
WL7	0.779	1.932			
Work Design			0.926	0.938	0.602
WD1	0.804	2.311			
WD2	0.753	1.964			
WD3	0.784	2.156			
WD4	0.779	2.125			
WD5	0.766	2.065			
WD6	0.772	2.078			
WD7	0.766	2.062			
WD8	0.790	2.226			
WD9	0.787	2.166			
WD10	0.757	1.942			
Work Context			0.962	0.965	0.580
WC1	0.774	2.347			
WC2	0.751	2.136			
WC3	0.790	2.480			
WC4	0.755	2.180			
WC5	0.752	2.207			
WC6	0.762	2.228			

WC7	0.773	2.371			
WC8	0.758	2.173			
WC9	0.790	2.515			
WC10	0.745	2.139			
WC11	0.747	2.138			
WC12	0.742	2.135			
WC13	0.738	2.076			
WC14	0.772	2.374			
WC15	0.726	2.008			
WC16	0.788	2.496			
WC17	0.756	2.197			
WC18	0.774	2.334			
WC19	0.777	2.367			
WC20	0.759	2.199			
Work World			0.859	0.899	0.639
WW1	0.803	1.858			
WW2	0.789	1.809			
WW3	0.777	1.717			
WW4	0.817	1.958			
WW5	0.811	1.937			
Training & Development			0.794	0.879	0.709
TD1	0.835	1.664			
TD2	0.846	1.705			
TD3	0.844	1.680			
Compensation & Benefits			0.798	0.881	0.712
CB1	0.854	1.746			
CB2	0.841	1.687			
CB3	0.836	1.669			
Performance Appraisal			0.804	0.884	0.718
PA1	0.870	1.862			
PA2	0.822	1.614			
PA3	0.850	1.780			
Recruitment & Selection			0.775	0.870	0.690
RS1	0.810	1.469			
RS2	0.845	1.720			
RS3	0.837	1.674			
Employee Happiness			0.920	0.933	0.609
EH1	0.794	2.177			
EH2	0.780	2.101			
EH3	0.790	2.127			
EH4	0.768	1.986			
EH5	0.813	2.338			
EH6	0.777	2.032			
EH7	0.776	2.031			

EH8	0.775	2.039			
EH9	0.750	1.867			
Electronic Health Record System			0.917	0.931	0.601
EHRS1	0.780	2.061			
EHRS2	0.775	2.065			
EHRS3	0.781	2.105			
EHRS4	0.762	1.939			
EHRS5	0.762	1.949			
EHRS6	0.784	2.122			
EHRS7	0.787	2.101			
EHRS8	0.767	1.954			
EHRS9	0.779	2.084			
Employee Retention			0.930	0.940	0.587
ER1	0.759	2.044			
ER2	0.767	2.119			
ER3	0.802	2.329			
ER4	0.734	1.882			
ER5	0.773	2.122			
ER6	0.753	1.989			
ER7	0.770	2.068			
ER8	0.761	2.002			
ER9	0.756	1.974			
ER10	0.768	2.077			
ER11	0.780	2.201			

Tables 3 (model 1) and 5 (model 2) show the reliability values that represent the internal consistency of constructs. This reliability is measured with Cronbach's alpha and Composite Reliability (CR). In both methods, the values above 0.7 indicate good reliability (Hair Junior et al., 2014; Nunnally & Bernstein, 1994). Tables 3 and 5 indicate that the values under both methods cross the minimum threshold; therefore, they indicate strong reliability for all variables in both model 1 and model 2.

Table 4. Discriminant Validity – Fornell Larcker Criterion (Model 1)

	1	2	3	4	5	6	7	8	9	10	11
Compensation & Benefits	**0.844**										
Electronic Health Record System	0.746	**0.775**									
Employee Happiness	0.629	0.702	**0.781**								
Employee Retention	0.761	0.732	0.719	**0.766**							
Performance Appraisal	0.688	0.737	0.631	0.649	**0.847**						
Recruitment & Selection	0.665	0.753	0.661	0.664	0.602	**0.831**					
Training & Development	0.796	0.670	0.660	0.674	0.766	0.781	**0.842**				
Work Context	0.664	0.743	0.736	0.748	0.659	0.665	0.682	**0.762**			
Work Design	0.756	0.726	0.708	0.730	0.648	0.666	0.664	0.744	**0.776**		
Work Life	0.736	0.710	0.704	0.719	0.648	0.653	0.659	0.733	0.721	**0.786**	
Work World	0.621	0.694	0.684	0.699	0.612	0.615	0.637	0.711	0.695	0.683	**0.800**

Moreover, Tables 3 and 5 show the values of convergent reliability for models 1 and 2. Ahmad et al. (2016) maintained that validity refers to the accuracy of the constructs in representing what they intend to measure. The two key types of validity include convergent and discriminant validity. Convergent validity is assessed through Average Variance Extracted (AVE). In this method, the values above 0.5 indicate that the constructs explain more than 50% of the variance in their indicators (Fornell & Larcker, 1981). In Tables 3 and 5, all the AVE values are greater than 0.5; therefore, they confirm the convergent validity for both models 1 and 2.

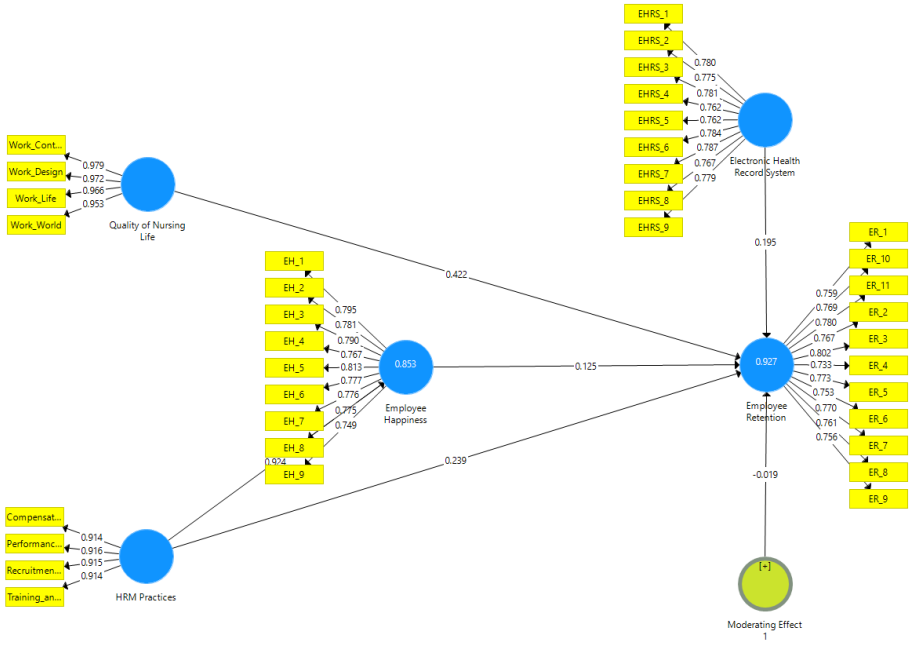

Figure 3. Measurement Model 2

With respect to discriminant validity, we used the criterion introduced by Fornell and Larcker (1981). According to this criterion, the square root of AVE must be greater than the correlation of the construct with all other constructs. Both Tables 3 and 5 show the diagonal values, which are the square root of AVE, and these values are greater than the correlations of the constructs with all other constructs. Therefore, the discriminant validity is also confirmed for models 1 and 2.

Table 5. Construct Reliability and Validity (Model 2)

	Cronbach's Alpha	CR	AVE	1	2	3	4	5
Electronic Health Record System	0.917	0.931	0.601	**0.775**				
Employee Happiness	0.920	0.933	0.609	0.702	**0.781**			
Employee Retention	0.930	0.940	0.587	0.732	0.719	**0.766**		
HRM Practices	0.935	0.954	0.837	0.731	0.724	0.742	**0.915**	
Quality of Nursing Work Life	0.977	0.983	0.936	0.749	0.739	0.755	0.860	**0.967**

Figure 4 shows the process and necessary steps for the assessment of the structural model, which is proposed by Hair Jr et al. (2017). The first step of calculating multicollinearity is already discussed above. The second step is related to calculating path coefficients. Table 7 shows the values of path coefficients in which direct, indirect, and moderating effects are represented.

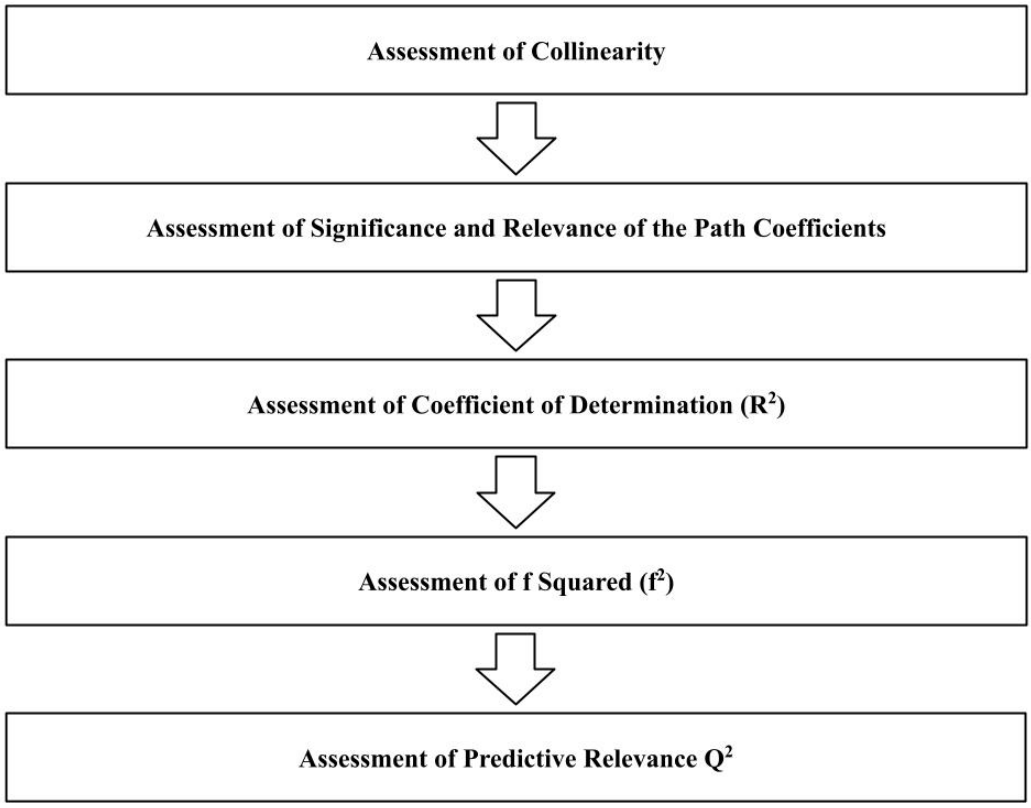

Figure 4. Structural Model Assessment Procedure

Table 7 shows that QNWL as a composite variable has a strong significant positive effect ($r = 0.422$, $p<0.05$) on employee retention. Therefore, this relationship supports the first hypothesis (H1). Table 7 also shows that work life has a low positive effect ($r = 0.077$, $p = 0.046$) on employee retention. This relationship supports hypothesis H1a.

Table 6. Multicollinearity (Model 2)

Variables	VIF Values	
	Employee Happiness	Employee Retention
Electronic Health Record System		4.672
Employee Happiness		3.950
Employee Retention		
HRM Practices	1.000	4.964
Quality of Nursing Life		6.377

Table 7 also shows that work design has a low but positive and significant effect (r = 0.094, p = 0.033) on employee retention. Therefore, this relationship supports hypothesis H1b. Furthermore, this table shows that work context has a moderate level of positive significant effect (r = 0.236, p<0.05) on employee retention. This relationship supports hypothesis H1c. Moreover, the work world has a low positive significant effect (r = 0.069, p = 0.046). Therefore, hypothesis H1d is supported.

Table 7. Path Coefficients (Model 1 and Model 2)

Hypotheses	Original Sample	Sample Mean	SD	T	P
Quality of Nursing Life -> Employee Retention	0.422	0.416	0.065	6.484	0.000
Work Life -> Employee Retention	0.077	0.082	0.038	2.020	0.046
Work Design -> Employee Retention	0.094	0.098	0.043	2.168	0.033
Work Context -> Employee Retention	0.236	0.235	0.050	4.738	0.000
Work world -> Employee Retention	0.069	0.065	0.034	2.022	0.046
HRM Practices -> Employee Retention	0.239	0.240	0.046	5.150	0.000
Training & Development -> Employee Retention	0.071	0.070	0.034	2.047	0.043
Recruitment & Selection -> Employee Retention	0.066	0.064	0.030	2.213	0.029
Performance Appraisal -> Employee Retention	0.039	0.035	0.026	1.481	0.142
Compensation & Benefits -> Employee Retention	0.081	0.082	0.024	3.386	0.001
HRM Practices -> Employee Happiness -> Employee Retention	0.115	0.117	0.039	2.929	0.004
QNWL*EHRS - Int -> Employee Retention	-0.019	-0.018	0.010	1.871	0.062

Table 7 indicates that HRM practices as a composite variable have a moderate level of positive significant effect (r = 0.239, p<0.05) on employee retention. This relationship supports hypothesis H2. The first dimension of

HRM practices, namely training and development, as a separate variable, has a significant positive effect (r = 0.071, p = 0.43) on employee retention. Therefore, this relationship supports hypothesis H2a. Table 7 also shows that recruitment and selection have a positive significant effect (r = 0.066, p = 0.029) on employee retention, which supports H2b. However, the effect of performance appraisal on employee retention is insignificant (r = 0.039, p = 0.142); therefore, this relationship does not support H2c.

Table 8. Coefficients of Determination (Model 1 and Model 2)

Model		R Square	R Square Adjusted
Model 1	Employee Retention	0.927	0.926
Model 2	Employee Happiness	0.853	0.853
Model 2	Employee Retention	0.927	0.926

Table 7 shows that the fourth dimension of HRM practices, namely compensation and benefits, has a significant positive effect (r = 0.081, $p<0.05$) on employee retention; therefore, it supports H2d. Apart from direct effects, table 7 shows that HRM practices, a composite variable, have a significant positive effect (r = 0.115, $p<0.05$) on employee retention in the partial mediation role of employee happiness. Therefore, this relationship supports H3. Finally, Table 7 shows that EHRS has no significant effect (r = -0.019, p = 0.062) on employee retention; therefore, H4 is rejected.

Table 9. Effect Size f^2 (Model 1)

	Employee Retention
Compensation & Benefits	0.020
Electronic Health Record System	0.037
Employee Happiness	0.017
Performance Appraisal	0.005
Recruitment & Selection	0.012
Training & Development	0.013
Work Context	0.040
Work Design	0.010
Work Life	0.008
Work World	0.009

In the process of structural model assessment, the third stage is calculating the coefficient of determination, which is presented in Table 8. The coefficient of determination is calculated for measuring the explanatory power of a regression model (Nakagawa et al., 2017). In table 8, the R^2 values in models 1 and 2 are the same as 0.927, which shows that all the independent variables explain around 92.7% variance in employee retention. Regarding the second model, with endogenous variables such as employee happiness, table 8 shows that 0.853 variance in employee happiness is explained due to all exogenous variables in the model. In both models, the explanatory power is substantial, and adjusted R^2 values further validate these models.

Table 10. Effect Size f^2 (Model 2)

	Employee Happiness	Employee Retention
Electronic Health Record System		0.049
Employee Happiness		0.024
HRM Practices	5.809	0.056
Quality of Nursing Life		0.113

The fourth stage proposed by Hair et al (2017) is a calculation of effect size or f^2.

The effect size (f^2) values in table 9 show the influence of different exogenous variables on employee retention, while table 10 represents the effect size of different exogenous variables on employee happiness and employee retention. In model 1, most predictors, including CB, EHRS, and WC, have a small effect based on the guidelines (small=0.02, medium=0.15, and large=0.35) of Cohen (1988). These small effect sizes indicate modest impacts on employee retention. However, PA has a negligible effect ($f^2 = 0.005$); therefore, it shows no significant effect on employee retention. With respect to model 2, table 10 shows that the effect size of HRM practices on employee happiness is very large ($f^2 = 5.809$). However, its effect on employee retention is small ($f^2 = 0.056$). In addition, EHRS has a small effect on retention ($f^2 = 0.049$), while QNWL shows a small to medium effect on retention ($f^2 = 0.113$). These findings highlight that HRM practices strongly affect happiness, while other variables have relatively smaller effects on retention.

Table 11. Predictive Relevance Q^2 (Model 1 and 2)

Model	Q Square	SSO	SSE	Q^2 (=1-SSE/SSO)
1	Employee Retention	4609.000	2137.671	0.536
2	Employee Happiness	3771.000	1828.491	0.515
2	Employee Retention	4609.000	2135.743	0.537

The final fifth stage of structural model assessment proposed by Hair et al (2017) is an assessment of predictive relevance Q^2 that is calculated through a blindfolding procedure in SmartPLS. Table 11 presents the Q^2 values for employee retention and employee happiness in Model 1 and Model 2.

The Q^2 value of 0.536 for employee retention in Model 1 suggests a strong predictive relevance. In Model 2, the Q^2 values of 0.515 for employee happiness and 0.537 for employee retention both exceed the threshold of 0.2. These values indicate that the models have substantial predictive relevance for both constructs.

Discussion

The present study investigates the issue of high nurse turnover in Jordan's public and university hospitals, which negatively impacts both the performance and efficiency of these healthcare institutions. Based on the results, the study confirms that QNWL and HRM practices positively influence nurse retention. This finding represents hypotheses H1 and H2. The findings are aligned and consistent with the previous findings (Bibi et al., 2018; Kaddourah et al., 2018; Lee et al., 2015; Liana Qatamin, 2023; Salahat & Al-Hamdan, 2022). Regarding QNWL, the results validate the hypothesis (H1). These results show that QNWL has a significant positive impact on nurse retention. In addition, each dimension of QNWL, including work-life, work design, work context, and work world, positively influences employee retention. For instance, conflicts between personal and professional life increase stress, which results in nurses' intention to leave the organization (Wardana et al., 2020). This concept aligns with H1a. Similarly, work design (H1b) enhances the autonomy of nurses, which increases their job satisfaction and commitment (Agus & Selvaraj, 2020). In this way, work design boosts nurse reten-

tion. Furthermore, work context (H1c) and work world (H1d) also play considerable roles in promoting a supportive environment that leads to retention (Coetzee & Gunz, 2012; Kundu & Lata, 2017).

Regarding HRM practices, the study found mixed results. The results indicate that training and development (H2a) and recruitment and selection (H2b) positively impacted nurse retention. These findings are supported by previous research (Abba, 2018; Agwu & Nwoke, 2019; Fletcher et al., 2018). However, the results indicated that the effect of performance appraisal (H2c) on retention was not significant. This result contrasts with previous findings of Pakira (2011) and Gulzar et al. (2017). These studies noted that performance appraisals enhance retention as they help in getting valuable feedback and professional growth. The rejection of H2c could be attributed to a lack of perceived fairness in performance evaluations within Jordanian hospitals (Rubel & Kee, 2015). Additionally, cultural factors such as hierarchical decision-making and limited feedback mechanisms may reduce the perceived value of performance evaluations. However, the effect of compensation and benefits (H2d) on retention was significant. Sutanto et al. (2023) found that nurses show greater loyalty and commitment if they perceive fair compensation. These findings reflect the critical role of skill development and financial incentives in promoting nurse loyalty, especially in resource-constrained public hospital settings.

Additionally, the study examined the mediation role of employee happiness between HRM practices and nurse retention. The findings confirmed that employee happiness significantly mediates this relationship, which is aligned with hypothesis H3. When nurses feel happy and satisfied with their

work environment, they are more likely to remain committed to their jobs. This relationship further strengthens the effect of HRM practices on retention (Thompson & Bruk-Lee, 2021). However, the moderating role of the EHRS on the relationship between QNWL and nurse retention (H4) was not supported. This finding suggests that while EHRS may contribute to operational efficiency, its impact on the connection between QNWL and retention is limited in the Jordanian healthcare context. The reason behind this insignificant relationship may be due to usability challenges or insufficient integration into daily practices (Khairat et al., 2020). Similarly, the non-significant moderation effect of EHRS may stem from inconsistent adoption or inadequate user training across public hospitals in Jordan, leading to limited practical impact on work-life quality.

Conclusions

Implications

This empirical study introduces a unique model integrating both QNWL and HRM practices to explore their combined effects on nurse retention. Also, this study incorporated two theories including STS and SET. Through these theories, the study offers a comprehensive understanding of how these independent variables influence nurse retention. Unlike previous conceptual studies (Gharaibeh, 2024), this research empirically validates the relationships between QNWL, HRM practices, and nurse retention. Additionally, this study also incorporated the mediating role of employee happiness and the moderating effect of the EHRS.

The practical implications of this study are significant regarding Jordan, where nurse turnover is a growing concern. The findings provide healthcare policymakers and hospital administrators with valuable insights into how to improve nurse retention by focusing on the critical areas of QNWL and HRM practices. Specifically, hospital administrators in Jordan should ensure the equitable implementation of performance appraisal systems with transparent feedback channels. Additionally, EHRS adoption should be accompanied by structured training programs and user-friendly interfaces to minimize disruption and enhance usability. By addressing key factors such as work-life balance, work design, training, recruitment, and compensation, healthcare institutions can enhance the work environment. In this way, they can increase nurse satisfaction and reduce turnover. Additionally, understanding the mediating role of employee happiness underscores the importance of creating a supportive and positive workplace culture, which further reinforces retention. Moreover, the study highlights the limitations of relying solely on technical improvements like EHRS to improve retention. While EHRS can streamline operations, its moderating role was not supported. This relationship suggests that its influence on nurse retention is limited unless accompanied by improvements in the work-life quality of nurses. This insight directs healthcare institutions to focus on a more holistic approach that combines technological advancements with enhanced work conditions and HR practices.

Limitations and Future Suggestions

One of the limitations of this study is its focus on registered nurses in Jordanian public and university hospitals, which may limit the generalizability of the findings to other contexts. Future research could benefit from expanding the scope to include diverse healthcare settings and geographical regions to capture a broader perspective. Additionally, the study employed a cross-sectional design, which limits the ability to observe changes over time. Future studies should consider longitudinal research to track nurse retention trends and the long-term effects of HRM and QNWL improvements.

Further investigation into the role of employee happiness and the potential influence of workplace culture, leadership style, and job satisfaction on retention is recommended. By incorporating interdisciplinary approaches, such as psychological or sociological perspectives, future research can offer a more comprehensive understanding of retention dynamics. Additionally, comparative studies across different healthcare systems and countries could provide deeper insights into the global applicability of the findings.

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