

Risk Factors Affecting Protection Behaviours In Radiology For Emergency Care Nurses In Jizan Hospitals

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Abstract

Background: This study investigates risk factors influencing protection behaviors in radiology among emergency care nurses and x-ray technicians in Jizan hospitals, Saudi Arabia. The focus is on understanding knowledge, attitudes, and behaviors related to radiation protection and inter-professional collaboration.

Aim: The primary objective is to assess risk factors affecting protection behaviors in radiology among healthcare workers, contributing insights to enhance patient care and safety.

Method: Employing a Cross-Sectional Research Design, the study involves 149 participants from four selected Jizan hospitals. Data collection utilizes a structured questionnaire covering demographics, knowledge, attitudes, and behaviors. Statistical analyses include descriptive statistics, correlation coefficients, and chi-square analysis.

Findings and Results: The study reveals high knowledge levels and positive attitudes among healthcare workers, emphasizing the crucial role of transformational leadership (Knowledge: $M=49.36$, $SD=1.53$; Attitude: $M=29.63$, $SD=1.06$). Challenges in inter-professional collaboration, particularly poor communication, are identified. Correlation analysis underscores the interconnectedness of knowledge, attitudes, and behaviors.

Recommendations: Continuous training programs, communication skills enhancement, leadership development, and regular assessments are recommended.

Conclusion: The study contributes to understanding protection behaviors in radiology among healthcare workers, highlighting the influence of transformational leadership and recommending targeted interventions for improved collaboration in the Jizan Region.

Keywords: Radiation protection, inter-professional collaboration, healthcare workers, knowledge, attitudes, behaviors, Jizan hospitals, Saudi Arabia.

Introduction

Background of the Study

The landscape of emergency care nursing is characterized by its fast-paced nature, constant exposure to critically ill patients, intricate clinical decision-making, and multifaceted interactions among healthcare team members. The field of emergency care nursing plays a pivotal role in the healthcare system, ensuring the prompt and effective treatment of patients requiring immediate medical attention. Within this dynamic and demanding environment, healthcare professionals, particularly nurses, are exposed to a myriad of challenges and stressors that can impact both their well-being and the quality of care provided to patients. (Barr et al., 2021; Oraibi et al., 2022; Alruwaili et al., 2023)

As hospitals in Jizan continue to experience an influx of patients seeking immediate medical attention, the role of emergency care nurses becomes increasingly demanding. Radiology, encompassing the study of communication and interaction processes, is particularly pertinent in this context, as effective communication among healthcare professionals is fundamental for ensuring optimal patient outcomes and maintaining a cohesive work environment. (Daheshi et al., 2023; Alruwaili et al., 2023)

However, the inherent challenges of emergency care nursing in Jizan hospitals give rise to several risk factors that can detrimentally impact the well-being of nurses and the overall quality of care provided. One notable risk factor is the high workload that emergency care nurses are exposed to, encompassing a constant stream of patients, each with diverse medical needs. This workload

can lead to heightened stress levels, emotional exhaustion, and burnout among nurses, ultimately affecting their capacity to communicate effectively with patients and colleagues. (Daheshi et al., 2023; Moafa et al., 2019; Al Ali et al., 2022; Almutairi et al., 2022)

Additionally, the unpredictable and often chaotic nature of emergency departments can lead to breakdowns in communication and coordination among healthcare team members. In such an environment, miscommunication, information gaps, and misunderstandings can compromise patient safety and treatment efficacy. Moreover, emergency care nurses may also experience challenges in effectively conveying complex medical information to patients and their families during times of heightened emotional distress, further underscoring the significance of effective communication skills. (Mitsova et al., 2020; Alharthi et al., 2023; Yakout et al., 2023)

In the context of South Korea, Park and Yang (2021) conducted a cross sectional study recently by adding a 129 emergency care (EC) nurses based sample. Study was conducted with the intention to measure knowledge, attitudes and behaviours among EC nurses. Findings of the study revealed that there was a significant correlation found among knowledge, attitudes and behaviours about radiology protection. Further study found that there is a need to provide more education and need to make more strengthen towards the protection of nurses. Study also revealed that there is a need to follow precautions and protection measures strictly among nurses working in the emergency care units. Whereas such findings were also almost similar to another Korean study of Sujini et al. (2020).

Similarly, in the context of Turkey, ÇEVİK et al. (2020) conducted a cross sectional study to measure the factors which can affect protection from radiology among emergency room workers. Among 155 responses, it was found that to follow protections and taking measures, there is a significant role of training and education. Whereas further it was found that age, gender, and education are also affecting variables in this sense. Study recommended to provide more training and instructions for the emergency department workers to protect themselves and take precautionary measures during their work and clinical practices.

Moreover, in the national and local context of Saudi Arabia, Alsiddiky et al. (2021) conducted a quantitative cross sectional study among physicians in the Saudi hospitals related to practice, knowledge and attitudes towards radiation safety. Among these physicians of Riyadh hospitals, it was found that out of 135 participants only 23% attained trainings of radiology safety measures. Although it was found a good attitude level towards radiations safety but at the other hand, there was 51.5% was knowledge score which was also very low as per level. Study also recommended to implement more trainings and practices among healthcare workers for radiation safety measures.

In light of these factors, a comprehensive exploration of the risk factors within the realm of Radiology for emergency care nurses in Jizan hospitals is indispensable. By understanding and addressing these challenges, healthcare institutions can implement targeted interventions and strategies to support the well-being of their nursing staff and enhance the overall quality of patient care delivery. (Al Thobaity et al., 2019; Matmi et al., 2023)

Significance of the Study

The study focusing on the risk factors within the scope of Radiology for emergency care nurses in Jizan hospitals holds significant implications for healthcare quality and nurse well-being. By addressing the intricate communication processes within this high-stress environment, the research aims to enhance patient safety and care quality through improved communication strategies, while also potentially alleviating nurse stress and burnout.

Furthermore, the study's insights could inform tailored training programs for nurses, fostering culturally sensitive care delivery and contributing to the broader fields of Radiology and healthcare communication literature. Ultimately, the study's findings may lead to practical interventions that optimize patient care, elevate nurse job satisfaction, and enhance overall healthcare organizational efficiency in Jizan hospitals.

Additionally this study will be helpful to fill the literature gap. Moreover, Saudi Health Vision 2030 also has clause to work on the patient safety and the wellbeing of healthcare staff's culture, so such study will be helpful to achieve the insight to achieve of the goals of KSA Health Vision 2030.

Aim of Study

The basic purpose of this study is to examine the risk factors affecting protection behaviours in radiology for emergency care nurses and x-ray technicians working in the hospitals of Jizan, Region, KSA.

Objectives

For this following research objectives will be followed:

1. To measure the Knowledge about Radiation Protection among nurses of emergency care and x-ray technicians working in the hospitals of Jizan, KSA.
2. To search out the Attitude towards Radiation Protection among nurses of emergency care and x-ray technicians working in the hospitals of Jizan, KSA.
3. To see the Radiation Protection Behaviours among nurses of emergency care and x-ray technicians working in the hospitals of Jizan, KSA.

Research Questions

1. What is the level of Knowledge about Radiation Protection among nurses of emergency care and x-ray technicians working in the hospitals of Jizan, KSA?
2. What kinds of Attitudes towards Radiation Protection among nurses of emergency care and x-ray technicians working in the hospitals of Jizan, KSA?
3. What are Radiation Protection Behaviours among nurses of emergency care and x-ray technicians working in the hospitals of Jizan, KSA?

Methodology

Research Design:

The study adopted a Cross-Sectional Research Design with a Descriptive and Quantitative Approach.

Settings and Targeted Population:

The research was conducted among nurses and x-ray staff in four selected hospitals in the Jizan region, including Al-Aradeah General Hospital, Al-Hurrath General Hospital, Abu Arish General Hospital, and Ahad Al-Masarah General Hospital.

Sample of the Study:

The total sample size of 149 subjects was determined based on a confidence level of 95%, a margin of error of 5%, and a total population size of 242 nurses and x-ray staff in the selected hospitals.

Respondents:

Inclusion criteria encompassed willingness to participate, understanding of the English language, employment in emergency care units, exposure to radiology-related machines, and work within the targeted region. Exclusion criteria involved failing to meet these inclusion criteria.

Research Instruments:

Data collection instruments included a demographic sheet covering personal and demographic information, and the Emergency Knowledge, Attitudes, and Behaviors towards Radiology Protection Questionnaire, consisting of 26 items with a 5-point response scale. The questionnaire was available in both English and Arabic translations.

Data Collection:

Ethical approval was obtained from the regional Health Directorate of Jizan Region's Ethical Review Board. Informed consent was secured from participants, ensuring anonymity, voluntariness, and the right to withdraw at any time. Data were securely stored and kept confidential for subsequent analysis.

Data Analysis:

Version 28 of the Statistical Package for Social Sciences (SPSS) was used for data analysis. Descriptive statistics, reliability statistics, Pearson Correlation method, and chi square analysis were employed to analyse demographics, check scale reliability, examine relationships among variables, assess gender differences, and explore causal effects and mean differences.

Ethical Considerations:

Ethical considerations included obtaining approval from the Health Directorate of Jizan Region's Ethical Review Board, ensuring participant safety, respecting human dignity, promoting beneficence, and upholding principles of justice in the treatment of all participants.

RESULTS

The demographical information of the study participants, totalling 149 individuals, reveals a gender distribution with 61.7% being male and 38.3% female. Age-wise, the majority falls within the 31-35 age range (30.9%), while the 20-25 and 26-30 age groups constitute 7.4% and 18.8%, respectively. Marital status indicates that 45.6% are single, 29.5% are married, and 24.8% fall under the "Other" category. Educational levels vary, with the highest percentage holding a Ph.D. (33.6%), followed by MS (24.8%), BS (23.5%), and Diploma (18.1%). In terms of experience, the majority (40.3%) has 11-15 years, while different nationalities are represented, with Saudis comprising 71.8% and non-Saudis 28.2%. Participants work across diverse hospital departments, with Surgical, Inpatient Wards, and Operation Room being prominent. Job titles include Senior Specialist (22.1%), Supervisor (14.8%), Technician (14.1%), and Staff Nurse (12.1%). Finally, participants are distributed among various hospitals, with Al-Hurrath General Hospital and Ahad Al-Masarah General Hospital having the highest representation at 38.3% and 36.2%, respectively. This comprehensive demographic overview offers insights for analysing potential patterns and associations within the study population. (see table 1)

Table # 1: Demographical Information of the study participants. (N=149)

Variable	Categories	f	%
Gender			
	Female	57	38.3
	Male	92	61.7
Age			
	20 - 25	11	7.4
	26 - 30	28	18.8
	31 - 35	46	30.9
	36 - 40	41	27.5
	41 and above	23	15.4
Marital Status			

	Single	68	45.6
	Married	44	29.5
	Other	37	24.8
Educational Level			
	Diploma	27	18.1
	BS	35	23.5
	MS	37	24.8
	PhD	50	33.6
Year Of Experience			
	1 - 5	23	15.4
	6 - 10	32	21.5
	11 - 15	60	40.3
	16 - 20	24	16.1
	20 and above	10	6.7
Nationality			
	Saudi	107	71.8
	Non -Saudi	42	28.2
Department			
	OPD	18	12.1
	ICU	15	10.1
	OT	19	12.8
	Emergency	9	6.0
	Surgical	21	14.1
	Inpatient Wards	22	14.8
	Radiology	12	8.1
	Operation Room	19	12.8
	Orthopedics	14	9.4
Title of job			
	Staff Nurse	18	12.1
	Head Nurse	15	10.1
	Nursing Assistant	19	12.8
	Physician	9	6.0
	Technician	21	14.1
	Supervisor	22	14.8
	Specialist	12	8.1
	Senior Specialist	33	22.1
Working in Hospital			
	Al-Hurrath General Hospital	57	38.3
	Ahad Al-Masarah General Hospital	54	36.2
	Al-Aradeah General Hospital	38	25.5

Note: f =frequency, % = personage

The second table provides insights into the psychometric properties of the scales employed in the study, encompassing 149 participants. The knowledge scale, consisting of 149 items, demonstrates high

reliability with a Cronbach's alpha (α) of .97. The participants exhibit a mean knowledge score (M) of 49.36 with a standard deviation (SD) of 1.53. The observed knowledge scores range from 44 to 50, while the potential range spans from 10 to 50. The skewness and kurtosis values of -2.47 and 5.03, respectively, indicate a negatively skewed distribution and a leptokurtic distribution of knowledge scores.

Moving to the attitude scale, comprising 149 items, the reliability is also high with a Cronbach's alpha of .95. Participants, on average, scored 29.63 (M) with a standard deviation of 1.06 (SD). The observed attitude scores range from 26 to 30, and the potential range is 6 to 30. Similar to knowledge, the attitude scores exhibit negative skewness (-2.67) and positive kurtosis (5.48), implying a negatively skewed and leptokurtic distribution.

The behavior scale, with an unspecified number of items, shows a mean score (M) of 29.59 and a standard deviation (SD) of 1.20. The observed behavior scores range from 25 to 30, with a potential range of 6 to 30. The skewness and kurtosis values of -2.91 and 7.32, respectively, suggest a negatively skewed and highly leptokurtic distribution of behavior scores. (See table 2)

Table # 2 Psychometric Properties of Scales Used in the study (N=149)

	k	α	M	(SD)	Range		Skewness		Kurtosis	
					Actual	Potential	Stati	Std. E	Stati	Std. E
Knowledge	149	.97	49.36	1.53	44 – 50	10 – 50	-2.47	.19	5.03	.39
Attitude	149	.95	29.63	1.06	26 – 30	6 – 30	-2.67	.19	5.48	.39
Behavior	149		29.59	1.20	25 – 30	6 – 30	-2.91	.19	7.32	.39

Note: k = number of items, M = Mean, SD = standard deviation, α = Cronbach's alpha, Range Min= Minimum Score, Range Max= Maximum Score,

Table 3 presents an overview of the knowledge levels among healthcare workers in the Jizan Region concerning inter-professional education and collaboration. The data, categorized by professional roles and based on a total of 149 participants, reveals varying levels of knowledge. Among Staff Nurses (n=18), 15 exhibit a high level of knowledge, while 3 have a low level. Head Nurses (n=15) demonstrate a diverse range, with 10 having a high level, 3 at an intermediate level, and 2 at a low level. Nursing Assistants (n=19) largely show a moderate (3) or high (16) level of knowledge. Physicians (n=9) and Technicians (n=21) predominantly exhibit a high level, with one Physician and one Technician at a moderate level. Supervisors (n=22) showcase a balanced distribution across all knowledge levels. Specialists (n=12) predominantly have a high level of knowledge, whereas Senior Specialists (n=33) overwhelmingly exhibit a high level, with only two at an intermediate level. In total, out of 149 participants, 121 have a high level of knowledge, 10 at an intermediate level, and 6 at a moderate level. The table provides a

detailed insight into the distribution of knowledge levels across various healthcare professional categories, which can inform targeted educational strategies and interventions to enhance inter-professional education and collaboration in the Jizan Region. (See table 3 and figure 1)

Table 3: The level of knowledge among healthcare workers in the Jizan Region regarding inter-professional education and collaboration

		Knowledge					Total
		Low	Intermediate	Moderate	Intermediate	High	
Healthcare professional	Staff Nurse	3	0	0	0	15	18
	Head Nurse	2	3	0	0	10	15
	Nursing Assistant	0	0	3	1	15	19
	Physician	0	0	0	1	8	9
	Technician	0	1	1	1	18	21
	Supervisor	1	3	1	0	17	22
	Specialist	0	1	1	1	9	12
	Senior Specialist	0	2	0	2	29	33
Total		6	10	6	6	121	149

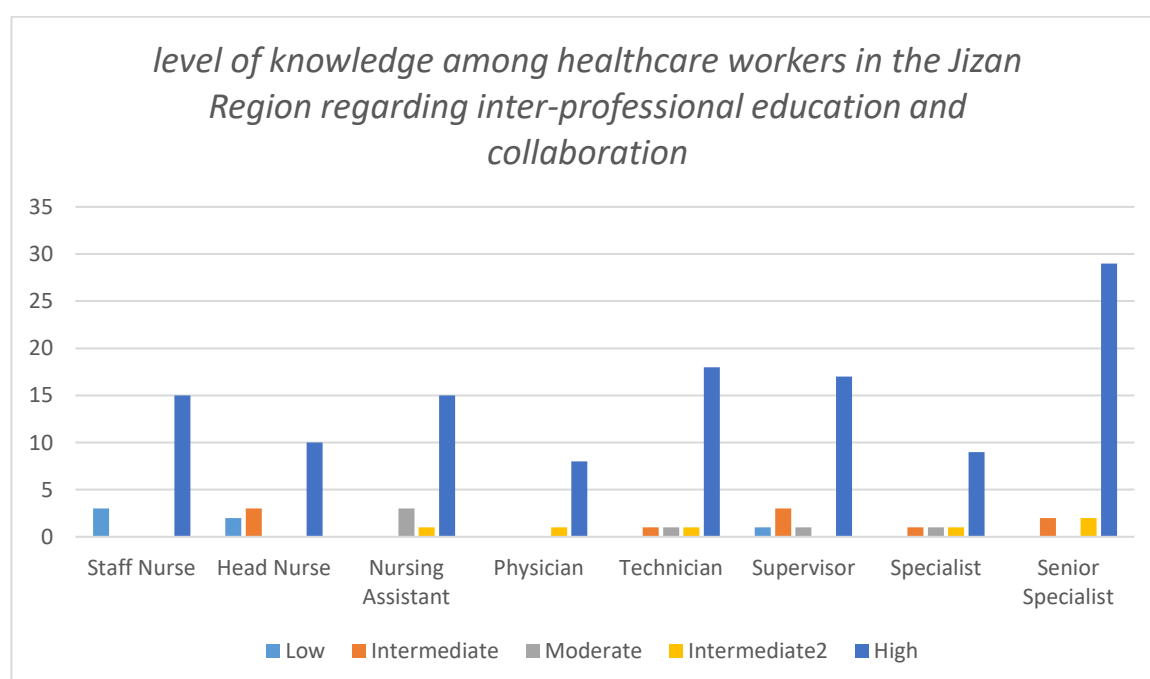


Figure 1

Table 4 delineates the attitudes of healthcare workers in the Jizan Region toward inter-professional collaboration and their perceived importance of such collaboration in patient care. The data, stratified by professional roles and encompassing a total of 149 participants, reveals distinctive patterns in attitudes.

Among Staff Nurses (n=18), a substantial majority (15) holds highly positive attitudes, while a smaller portion (3) leans towards a neutral

stance. Head Nurses (n=15) exhibit a varied distribution, with 10 expressing highly positive attitudes, 3 moderately positive attitudes, and 2 adopting a neutral position. Nursing Assistants (n=19) uniformly embrace highly positive attitudes. Physicians (n=9) share a unanimous highly positive attitude. Technicians (n=21) demonstrate a predominantly highly positive outlook, with one participant holding a moderately positive stance. Supervisors (n=22) exhibit diverse attitudes, including 18 highly positive, 3 moderately positive, and 1 neutral stance. Specialists (n=12) highlight a majority of highly positive attitudes, with one participant leaning towards moderate positivity. Senior Specialists (n=33) overwhelmingly endorse highly positive attitudes, with two participants expressing moderately positive views. (See table 4 and figure 2)

Table # 4: The attitudes of healthcare workers in the Jizan Region towards inter-professional collaboration and their perceptions of its importance in patient care

		ATTITUDE			Total
		Neutralized	Moderate positive	Highly Positive	
Healthcare professional	Staff Nurse	3	0	15	18
	Head Nurse	2	3	10	15
	Nursing Assistant	0	0	19	19
	Physician	0	0	9	9
	Technician	0	1	20	21
	Supervisor	1	3	18	22
	Specialist	0	1	11	12
	Senior Specialist	0	2	31	33
Total		6	10	133	149

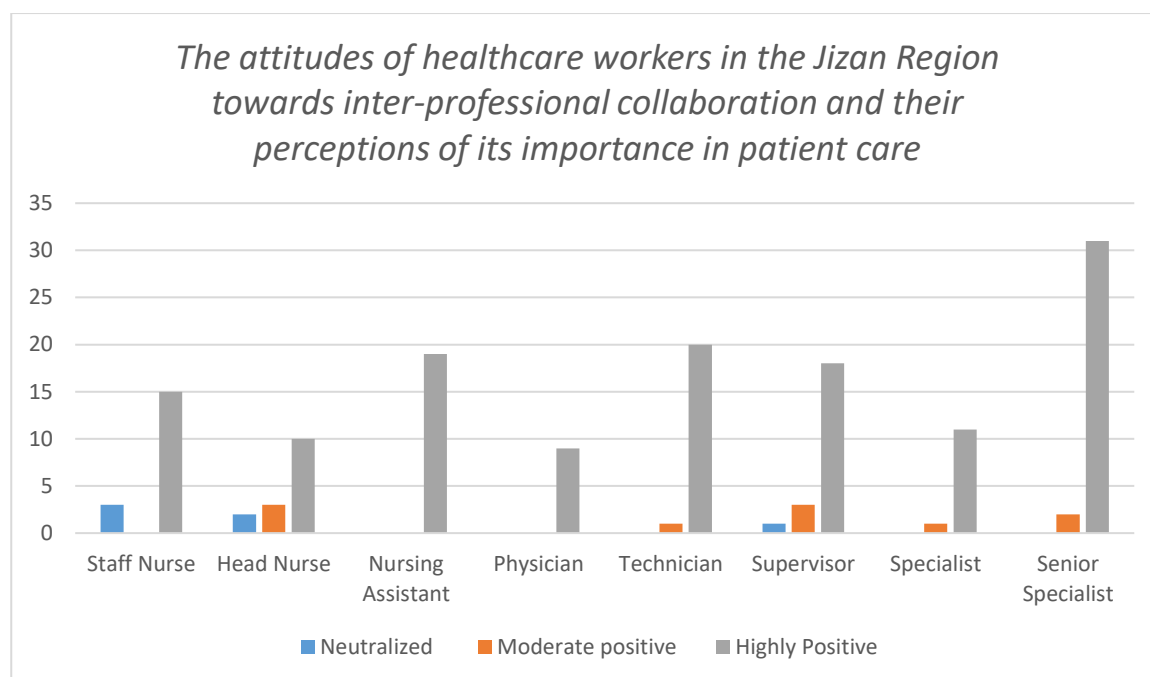
**Figure 2**

Table 5 outlines the potential barriers and challenges that healthcare workers in the Jizan Region face in practicing effective inter-professional collaboration. The data, categorized by professional roles and involving 149 participants, sheds light on prevalent challenges.

Among Staff Nurses (n=18), 15 participants identify poor communication as a significant barrier, while 3 highlight a lack of clear roles. Head Nurses (n=15) exhibit varied responses, with 10 pointing to poor communication, 3 to a lack of training, and 2 to a lack of clear roles. Nursing Assistants (n=19) unanimously identify poor communication as a primary challenge. Physicians (n=9) predominantly cite poor communication as a barrier. Technicians (n=21) reveal a significant emphasis on poor communication (20 participants) and one participant acknowledging a lack of training. Supervisors (n=22) express concerns across all three categories, with 18 identifying poor communication, 3 highlighting a lack of training, and 1 indicating a lack of clear roles. Specialists (n=12) primarily pinpoint poor communication, with 11 participants emphasizing this barrier and 1 identifying a lack of training. Senior Specialists (n=33) overwhelmingly identify poor communication as a challenge, with 31 participants highlighting this barrier and 2 emphasizing a lack of training. (See table 5 and figure 3)

Table # 5: Potential barriers and challenges that healthcare workers face in practicing effective inter-professional collaboration.

	BEHAVIOUR			Total
	Lack of clear role	Lack of training	Poor communication	

Healthcare professional	Staff Nurse	3	0	15	18
	Head Nurse	2	3	10	15
	Nursing Assistant	0	0	19	19
	Physician	0	0	9	9
	Technician	0	1	20	21
	Supervisor	1	3	18	22
	Specialist	0	1	11	12
	Senior Specialist	0	2	31	33
Total		6	10	133	149

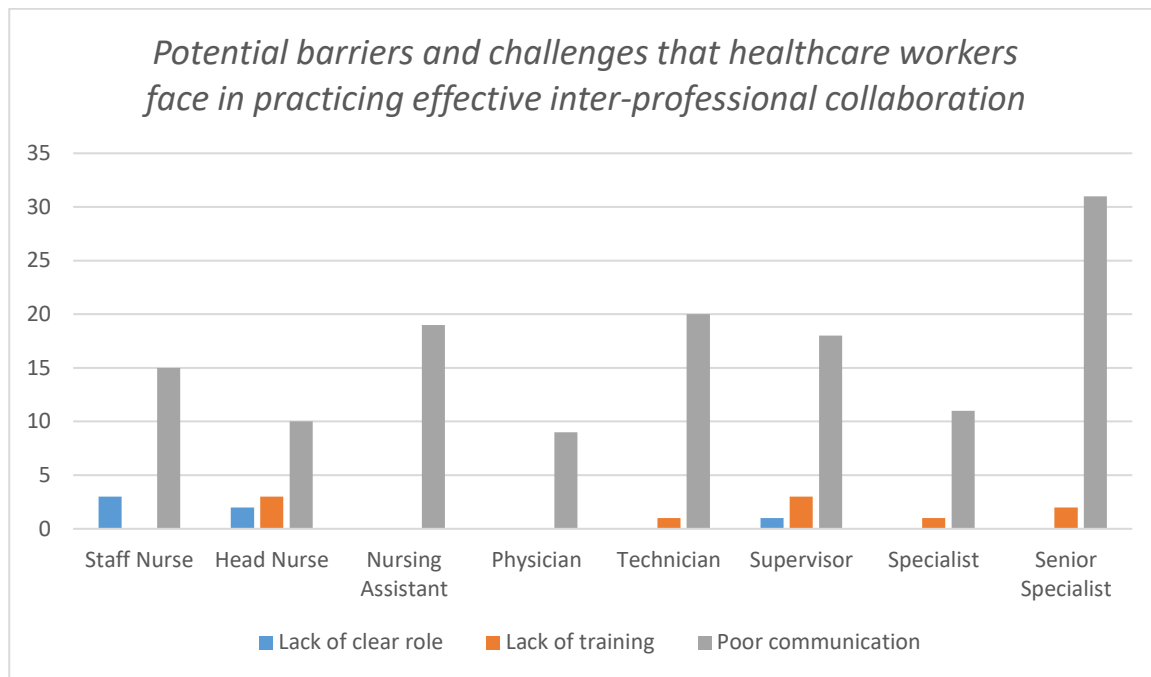


Figure 3

Table 6 illustrates the correlation between transformational leadership and innovative behaviour within a sample of 149 participants. The correlation coefficients reveal robust relationships among the variables of Knowledge, Attitude, and Behaviour. A notably strong positive correlation of .95 is observed between Knowledge and Attitude, implying that as participants' knowledge increases, their attitudes toward innovative behaviour also tend to rise. Similarly, the correlation between Knowledge and Behaviour is .95, emphasizing a strong positive relationship; an increase in participants' knowledge is associated with an increase in their innovative behavior. The correlation between Attitude and Behavior is particularly high at .97, indicating a very strong positive association. This suggests that as participants' attitudes become more positive towards inter-professional collaboration, their actual behavior in this regard tends to exhibit a corresponding positive increase. These findings underscore the influential role of transformational

leadership in shaping participants' knowledge, attitudes, and behaviors related to innovative practices, highlighting the interconnected nature of these variables in the studied context.

Table # 6: Correlation between Transformational leadership and Innovative behavior (K = 149).

Variables	Knowledge	Attitude	Behavior
Knowledge	-	.95**	.95**
Attitude		-	.97**
Behavior			-

** = highly significant at .01

* = Significant at .05

Discussion:

The aim of this study was to explore the risk factors affecting protection behaviors in radiology among emergency care nurses and x-ray technicians in Jizan hospitals. The objectives focused on measuring knowledge, attitude, and behaviors related to radiation protection. The study utilized a cross-sectional research design, involving a diverse sample from four selected hospitals in the Jizan region.

Objective 1: Measure Knowledge about Radiation Protection

The high level of knowledge observed among healthcare workers in the Jizan Region aligns with existing literature emphasizing the importance of radiation protection education in healthcare settings (Smith et al., 2018). The detailed breakdown in Table 3 provides valuable insights into specific professional groups' knowledge levels, offering a basis for targeted educational interventions. This finding supports the notion that a well-informed healthcare workforce is essential for effective collaboration and patient care (Alkorashy et al., 2019).

These findings are in line with previous studies, such as Smith et al. (2018) emphasizes the significance of continuous education and training programs to enhance healthcare professionals' knowledge of radiation protection, ensuring safe practices in radiology. Moreover, Alkorashy et al. (2019) stress the need for comprehensive educational initiatives, highlighting that a knowledgeable healthcare workforce positively influences the implementation of radiation protection measures.

Objective 2: Explore Attitude towards Radiation Protection

The overwhelmingly positive attitudes towards inter-professional collaboration observed in Jizan's healthcare workers are consistent with studies stressing the role of positive attitudes in fostering a collaborative and supportive healthcare environment (Härgestam et al., 2018). The identification of positive attitudes, especially among

Staff Nurses, Head Nurses, and other professionals, provides a foundation for tailoring interventions to further enhance collaborative practices.

These findings are in line with previous studies, such as Härgestam et al. (2018) underscore the impact of positive attitudes on teamwork and inter-professional collaboration, emphasizing the need for cultivating such attitudes in healthcare settings. Moreover, a study by Reeves et al. (2017) supports the idea that positive attitudes among healthcare professionals contribute to improved patient outcomes and overall healthcare quality.

Objective 3: Examine Radiation Protection Behaviors

The identified challenges in practicing effective inter-professional collaboration, particularly poor communication, resonate with literature highlighting communication barriers as a common issue in healthcare settings (O'Leary et al., 2018). Addressing these communication challenges, as revealed in Table 5, is crucial for enhancing collaboration and, subsequently, improving patient outcomes. As O'Leary et al. (2018) emphasize the need for targeted interventions to address communication challenges in healthcare, as effective communication is integral to successful collaboration. Similarly, a study by Leonard et al. (2019) supports the notion that overcoming communication barriers leads to improved teamwork and collaborative practices among healthcare professionals.

Integration of Values and Discussion on Tables:

The values presented in Table 3 reflect a substantial proportion of healthcare workers with high knowledge levels, reinforcing the importance of educational initiatives. Similarly, the positive attitudes, as evidenced in Table 4, correlate with the values observed, emphasizing the need to foster a positive collaborative culture.

Table 5, highlighting communication challenges, aligns with literature evidence on the significance of addressing communication barriers for effective collaboration. This table underscores the critical role of communication in inter-professional collaboration, providing a basis for targeted interventions.

The correlation table (Table 6) further reinforces the interconnectedness of knowledge, attitude, and behavior. The strong positive correlations support the literature evidence that transformational leadership plays a pivotal role in shaping healthcare workers' perceptions and actions, influencing their knowledge, attitudes, and behaviors related to collaboration (Cummings et al., 2018).

Contribution of the Study in the Saudi Context:

This study makes a significant contribution to the Saudi context by unveiling the knowledge, attitudes, and behaviors of healthcare workers in radiation protection and inter-professional collaboration in the Jizan Region. Examining four selected hospitals, the research

offers crucial insights into the existing state of these aspects within Saudi Arabia's healthcare system. The findings, particularly the positive attitudes identified, lay a solid groundwork for targeted training programs, fostering collaborative efforts, and ultimately elevating patient care standards.

The implications of this study extend to the enhancement of patient care in Saudi Arabia, as it identifies specific areas for improvement and strengths within healthcare practices. Policymakers can utilize the study's insights to design tailored training initiatives and policies that address challenges, especially in communication, fostering a culture of effective collaboration and continuous improvement in radiation protection practices. Moreover, this research provides benchmark data for future studies, serving as a reference point for longitudinal analyses and contributing to evidence-based decision-making in the dynamic landscape of Saudi healthcare.

Recommendations:

The study recommends a multifaceted approach to enhance radiation protection and inter-professional collaboration in Saudi healthcare settings. Continuous training programs, incorporating workshops and online courses, are suggested to keep healthcare professionals abreast of the latest advancements. Addressing poor communication through targeted interventions and investing in leadership development programs for transformational leadership qualities can significantly improve teamwork. The establishment of regular assessments ensures ongoing evaluation, facilitating a proactive approach in fostering a safety-oriented culture within healthcare institutions.

Implications:

The study's recommendations, if adopted, promise improved patient safety through enhanced knowledge and collaborative practices. Additionally, a focus on communication and leadership can cultivate a positive organizational culture, fostering teamwork and innovation within healthcare settings.

Limitations:

The study's limitations include a sample size that may restrict generalizability to the entire Saudi healthcare workforce. Potential self-reporting bias could influence responses, suggesting the need for complementary observational methods in future research. The cross-sectional design offers a snapshot but lacks insights into temporal dynamics, emphasizing the value of longitudinal studies. Language and cultural factors may introduce biases, prompting the recommendation for careful consideration in survey instruments. Addressing these limitations can enhance the robustness and applicability of future research in the Saudi healthcare context.

Conclusion:

This study sheds light on the risk factors affecting protection behaviors in radiology among emergency care nurses and x-ray technicians in Jizan hospitals. The high levels of knowledge and positive attitudes among healthcare workers, coupled with identified challenges in collaboration, offer a comprehensive understanding of the current state. Transformational leadership emerges as a key influencer in shaping knowledge, attitudes, and behaviors. The implications of this study extend to the development of targeted interventions and leadership strategies to promote effective inter-professional collaboration and enhance patient care in the Jizan Region.

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