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Knowledge, Attitudes, and Practices toward Physical Restraints among Intensive Care Unit Nurses: A Cross-Sectional Study

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Abstract:

Introduction: The present study aims to identify the level of nurses' knowledge, attitudes, and practices toward physical restraints and their associated factors, as well as determine the relationship between the level of nurses' knowledge, attitudes, and practices regarding physical restraint in ICUs in Jordan.

Methods: This cross-sectional study was conducted across intensive care units of four hospitals in Jordan during two months (January-February 2025). A cohort of 66 registered nurses was recruited. Participants' knowledge, attitudes, and practices regarding the use of physical restraints were assessed using the validated Acute/Critical Care Nurses' Knowledge of Physical Restraints Questionnaire. A multiple linear regression was conducted to identify factors influencing nurses' knowledge, attitudes, and practices toward physical restraints. Pearson correlation was used to assess the relationships among knowledge, attitude, and practice scores, with statistical significance set at $p < 0.05$ and a 95% confidence interval.

Results: Nurses demonstrated moderate levels of knowledge (11.2 ± 3), generally positive attitudes (31 ± 3.6), and moderate compliance with recommended physical restraint practices (22.7 ± 0.09). Reading about physical restraints emerged as a significant predictor (B=3.475, SE=1.064, β= 0.392, $p = 0.002$), indicating that nurses who had read about physical restraints scored higher on the practice scale. Knowledge was positively correlated with attitude scores ($r = 0.627$, $p < 0.001$).

Discussion: The findings underscore the need for targeted, ICU-specific educational interventions designed to enhance nurses' knowledge and attitudes toward the use of physical restraints.

Conclusion: Key findings reveal moderate knowledge and practice levels, with notable gaps in safety protocols and alternative interventions, reflecting patterns observed across multiple countries worldwide. Notably, we identified a positive relationship between knowledge and attitude, although this finding remains contested in the literature, suggesting that contextual influences require further investigation. The reliance on convenience sampling and the small sample size limit the generalizability of the findings, as the sample may not fully represent the broader population of healthcare professionals. Future research should investigate the effectiveness of targeted educational interventions in enhancing nurses' knowledge, attitudes, and ethical practices related to the use of physical restraints.

Keywords: Intensive care units, Nurses' knowledge, Physical restraints, Attitude, Practice, Jordan.

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1. INTRODUCTION

1.1. Background

The use of physical restraints in ICUs is a deeply ingrained practice, often justified under the guise of patient safety. These restraints are typically employed to prevent falls, manage confusion or delirium, and protect patients from harming themselves or others [1]. However, despite their use, the effectiveness of physical restraints is increasingly questioned, with mounting evidence suggesting that the risks associated with their use may outweigh the intended benefits [2]. Defined as any method that restricts a person's movement and limits access to their body, physical restraints can have profound physical, psychological, and emotional consequences for patients [3]. Research has consistently shown that the use of physical restraints is associated with a range of adverse outcomes, including an increased risk of nosocomial infections, more extended hospital stays, physical and emotional trauma, and even death [4-6]. Moreover, the psychological impact of being restrained can be severe, with studies indicating that patients who recall being restrained are significantly more likely to develop post-traumatic stress disorder [7]. Despite these concerns, physical restraints continue to be widely used in ICUs, often initiated outside of established institutional protocols and guidelines.

In many cases, the decision to apply restraints is made by nursing staff without consulting medical personnel, and without obtaining informed consent from patients or their families [8-10]. This practice is particularly troubling, given that nurses are frequently the primary decision-makers in the application and removal of physical restraints; yet, their knowledge and understanding of the risks associated with restraint use are often suboptimal [11, 12]. The prevalence of physical restraint use varies widely across different countries and even within different units of the same hospital. For example, in Jordan, the prevalence of physical restraint in ICUs has been reported at 35.8%, with some units, such as surgical ICUs, showing rates as high as 57.1% [13]. This variation highlights the need for standardized guidelines and policies to ensure the safe and ethical use of restraints; however, many hospitals, particularly in developing countries, lack such protocols [14]. The ethical and legal implications of using physical restraints are also a significant concern, particularly regarding the autonomy and dignity of patients [12]. The decision to restrain a patient, especially when done without proper justification or informed consent, raises serious questions about the respect for patients' rights and their ability to make decisions about their own care. Given the significant risks associated with the use of physical restraints, it is crucial to examine the knowledge, attitude, and practices of nurses regarding restraints, particularly in ICUs where the stakes are highest. Research indicates that nurses' understanding of physical restraints and their attitude toward their use are critical factors in determining whether restraints are applied safely and ethically [15]. Nurses who possess a higher level of knowledge and a more informed perspective on the risks and alternatives to physical restraints are better equipped to make decisions that prioritize patient safety and dignity [15]. To date, much of the research and regulatory focus on restraint use has been concentrated in mental health and long-term care settings [16-18]. However, given the unique challenges of ICU environments, where patients are often at their most vulnerable, there is a need for more research specific to these settings.

1.2. Purpose of the Study

This study aims to:

• Identify the level of nurses' knowledge, attitude, and practices toward the use of physical restraints in ICUs.

• Determine the relationship between the level of nurses' knowledge, attitude, and practices regarding physical restraint in ICUs in Jordan.

• Identify the predictors of nurses' levels of knowledge, attitude, and practices regarding physical restraints in ICUs in Jordan.

2. METHODS

2.1. Study Design

A descriptive cross-sectional design was employed to examine the knowledge, attitude, and practices of critical care nurses regarding the use of physical restraints in ICUs in Jordan. A cross-sectional design is efficient and cost-effective, allowing researchers to gather large amounts of data without the need for long-term follow-up. Since this study aims to measure existing knowledge, attitude, and practice levels and identify associations between them, rather than observe changes over time, the cross-sectional approach is methodologically appropriate.

2.2. Participants

The study employed a non-probability convenience sampling method, which was appropriate given the practical constraints of ICU settings and the limited number of available nurses. This approach enabled the researchers to include all eligible nurses who were accessible and willing to participate during the data collection period. Eligible participants were ICU nurses with at least six months of experience and holding either a diploma or a baccalaureate degree, as both qualifications involve direct and continuous patient care responsibilities in critical care environments.

The required sample size was calculated using G*Power 3.1.9.4 for linear multiple regression (fixed model, R^2 deviation from zero), with a significance level of $\alpha = 0.05$, medium effect size ($f^2 = 0.15$), power of 0.80, and five predictors. The result indicated a minimum of 92 participants. However, at the time of the study, only 66 nurses were working across the selected ICUs. To address this limitation and enhance representativeness, all ICUs in the targeted hospitals were included, and the entire available cohort of 66 nurses was invited to participate, resulting in full recruitment.

2.3. Study Instrument

A four-section questionnaire on physical restraints was used to gather data related to the knowledge level, attitudes, and practices of nurses regarding physical restraints. The items for the questionnaire were initially developed to study nursing personnel who worked in nursing homes in the United States. Formal authorization was secured from the original author to utilize the measurement instrument in this study. Intraclass correlation coefficient of the knowledge, attitude, and practice sections was 0.85, 0.84, and 0.99, respectively. The questionnaire, with a content validity index of 86%, consists of four sections. Section 1 measures the nurse's knowledge level regarding the use of restraints, encompassing 18 items. Correct responses were given a score of 1, and incorrect responses a score of 0, with "not sure" answers included in the incorrect category. The highest score was 18, reflecting the best knowledge. Section 2 focuses on measuring nurses' attitudes toward the use of restraints with 12 items. The participants were asked to respond on a 3-point Likert scale regarding whether they agreed, disagreed, or were undecided. Each item was given a score of 1 for undecided, 2 for disagree, and 3 for agree. Higher scores thus reflected a positive attitude. Reverse scoring was done for negative items. A score between 12 and 20 indicates a low attitude level, a score of 21 to 28 reflects a moderate level, and a score of 29 to 36 represents a high attitude level. Section 3 addresses nursing practice issues through 17 items. Participants rated their frequency of practice implementation using a 3-point Likert scale (always, sometimes, never). Responses were numerically coded (2 = always, 1 = sometimes, 0 = never), yielding a total possible score range of 0–34, with higher scores indicating more optimal practices. Reverse scoring was done for negative items (Table **1**). The final section of the questionnaire collects personal and clinical data related to restraint use, including age, gender, marital status, years of experience in ICUs, educational level, and whether the respondent has read any information about physical restraint, as well as the percentage of patients restrained in the selected unit. The reliability coefficients (Cronbach's alpha) for the knowledge, attitude, and practice scales used in this study were 0.64, 0.66, and 0.77, respectively. The reliability coefficients obtained in the current study indicate moderate internal consistency, particularly in the knowledge and attitude subscales. These results suggest that further refinement of some items may be necessary to enhance the tool's reliability and ensure more consistent measurement in the ICU context.

2.4. Data Collection and Ethical Consideration

This cross-sectional study was conducted in the ICUs of four hospitals located across four governorates in southern Jordan. The types of all included ICUs are general, which receive critically ill patients requiring advanced monitoring and life support. Common cases received in the selected ICUs include respiratory failure, cardiovascular emergencies, neurological crises, sepsis and septic shock, gastrointestinal/hepatic emergencies, acute kidney injury, diabetic ketoacidosis, and anaphylaxis. The data were gathered between January 2025 and February 2025, following ethical approval from both the university's institutional review boards and the Ministry of Health. Four research assistants carried out the data collection process. To ensure consistency and minimize data collection bias, four research assistants were trained prior to the start of data collection. Training sessions covered the study objectives, ethical considerations, inclusion criteria, procedures for obtaining informed consent, and standardized instructions for administering the questionnaire. Research assistants also received a detailed protocol manual outlining the step-by-step process for approaching participants, addressing questions, and handling completed surveys.

Table 1. Instrument structure and scoring summary.

Section	Items	Scale Type	Scoring	Score Range	Interpretation
Knowledge	18	True/False/Not Sure	1 = Correct, 0 = Incorrect/Not Sure	0–18	Higher = Better knowledge
Attitude	12	3-point Likert (Agree/Disagree/Undecided)	3 = Agree, 2 = Disagree, 1 = Undecided (Reversed for negative items)	12–36	Higher = More positive attitude
Practice	17	3-point Likert (Always/Sometimes/Never)	2 = Always, 1 = Sometimes, 0 = Never (Reversed for negative items)	0–34	Higher = More optimal practice

Research assistants approached nurses at the start of their shifts, providing eligible participants with an information sheet outlining the study details and a consent form for their review and signature. Confidentiality was maintained, and the collected data were used exclusively for research purposes. Participants were assured anonymity and were informed that they could withdraw from the study at any time without consequences. Once written informed consent was obtained, the structured questionnaire was administered. On average, nurses took approximately 15 to 20 minutes to fill out the survey.

2.5. Data Analysis

The data were processed using IBM SPSS Statistics for Windows, Version 30.0 **(**IBM Corp., Armonk, NY). Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as means and standard deviations, assuming a normal distribution. Prior to analysis, data were screened for missing values. Cases with substantial missing data were excluded listwise, while minimal missing responses (fewer than 5% of total items) were handled using mean imputation to preserve sample size without introducing significant bias. To identify factors affecting nurses' knowledge, attitudes, and practices regarding physical restraints, a multiple linear regression analysis was performed. Additionally, Pearson correlation was used to assess the relationships between nurses' knowledge, attitude, and practice scores. Statistical significance was set at a p-value < 0.05, with a 95% confidence interval applied.

3. RESULTS

3.1. Characteristics of the Participants

The study included 66 nurses, whose ages ranged from 24 to 50 years, with an average of 32 years (SD = 5.05). A slight majority were male (n= 37, 56.1%). Most participants were married (n = 29, 63.6%). Participants reported an average of 9 ± 4.8 years of work experience.. More than half (56.1%) reported having read about physical restraints (Table **2**).

3.2. Knowledge Level

The average knowledge score among nurses was 11.23 (SD = 2.91) on an 18-point scale, with individual scores ranging from 4 to 18. (Table **3**). The findings show that while ICU nurses demonstrated sound knowledge in some areas, such as recognizing that restraints are used to prevent harm (90.9%) and require a physician's order (71.2%), important gaps remain. Only 66.7% knew patients can refuse restraints, and 63.6% were aware of the legal consequences of misuse. Knowledge about safe application was variable; for example, only 59.1% knew that restraints must be reassessed every two hours, and 60.6% identified the correct application techniques. Awareness of risks was also limited, with only 57.6% recognizing restraint-related mortality and 56.1% rejecting the idea that no alternatives exist.

Table 2. Socio-demographic characteristics of participant nurses.

Variable		Mean	SD	N (%)
Age		32	5.0	-
Gender	Male	-	-	37 (56.1%)
	Female			29 (43.9%)
Marital status	Single	-	-	24 (36.4%)
	Married			42 (63.6%)
Educational level	Diploma	-	-	4 (6%)
	Bachelore			60 (90.9%)
	Master			2 (3%)
Years of experience		9	5.0	-
Reading about physical restraints	Yes	-	-	37 (56.1%)
	No			29 (43.9%)
Working shift	Day	-	-	37 (56.1%)
	Night			14 (21.2%)
	Rotating			15 (22.7%)
Using alternatives to restraints	Yes	-	-	18 (27.3%)
	No			48 (72.7%)
Approximately what percentage of patients are restrained in your unit	≤10%	-	-	35 (53%)
	>10%			31 (47%)

Table 3. Items of the knowledge questionnaire about the use of physical restraints (n=66).

Knowledge Item	Correct Response	Correct (%)
Restraints are legal only when medically justified	True	80.3%
Patients can refuse the use	True	66.7%
Improper restraint use may lead to assault charges	True	63.6%
Nurses can apply restraints in emergencies without a prior physician order	True	69.7%
Safety vests restrict movement to prevent harm	True	90.9%
Restraints require a physician's order	True	71.2%
Restraints must be removed and reassessed every 2 hours	True	59.1%
Restraints should be applied snugly	False	60.6%
Supine restraint is contraindicated due to aspiration risk	True	60.6%
Bed restraints should use fixed points, not side rails	True	60.6%
Sheet restraints may sometimes be necessary	False	69.7%
Shift-specific documentation for every restrained patient is required	True	78.8%
A physician's order to restrain should be specific	True	74.2%
Restraint is used most frequently in cases of delirium or confusion	True	63.6%
Restraint can cause skin breakdown or increased restlessness	True	72.7%
No good alternatives to restraints exist	False	56.1%
Deaths have been associated with vest-type restraints	True	57.6%
Restraints are justified when direct observation is not feasible	False	63.6%
Total knowledge score	Mean (SD)	11.2 (3)
	Range	4-18
Knowledge Item	**Correct Response**	**Correct (%)**
Restraints are legal only when medically justified	True	80.3%
Patients can refuse the use of restraints	True	66.7%
Improper restraint use may lead to assault charges	True	63.6%
Nurses can apply restraints in emergencies without a prior physician order	True	69.7%
Safety vests restrict movement to prevent harm	True	90.9%
Restraints require a physician's order	True	71.2%
Restraints must be removed and reassessed every 2 hours	True	59.1%
Restraints should be applied snugly	False	60.6%
Supine restraint is contraindicated due to aspiration risk	True	60.6%
Bed restraints should use fixed points, not side rails	True	60.6%
Sheet restraints may sometimes be necessary	False	69.7%
Shift-specific documentation for every restrained patient is required	True	78.8%
A physician's order to restrain should be specific	True	74.2%
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No good alternatives to restraints exist	False	56.1%
Deaths have been associated with vest-type restraints	True	57.6%
Restraints are justified when direct observation is not feasible	False	63.6%
Total knowledge score	Mean (SD)	11.2 (3)
	Range	4-18

3.3. Attitude Level

The total attitude score had a mean of 31 ± 3.6 with a range of 20 to 36, indicating a generally positive attitude toward managing the ethical and emotional challenges of restraint use. Over four-fifths of nurse respondents (81.8%) affirmed family decision-making authority regarding restraint refusal. 65.2% of nurses felt that they have the right to refuse to place patients in restraints. When reflecting on patient autonomy, 69.7% of nurses agreed that patients should have the right to refuse or resist restraints. Despite these positive attitudes, emotional conflict was evident: 62.1% reported feeling guilty when using restraints, and 66.7% expressed embarrassment when families discovered restraints were used without prior notification. This reveals a contradiction between ethical beliefs and clinical actions, suggesting that while nurses value autonomy and shared decision-making, organizational culture or a lack of alternatives may pressure them into actions that conflict with their values (Table **4**).

Table 4. Items of the attitude questionnaire about the use of physical restraints (n=66).

Attitude Item		Agree	Disagree	Undecided
		N (%)	N (%)	N (%)
I feel that family members have the right to refuse the use of the restraints		54 (81.8)	9 (13.6)	3 (4.5)
I feel that the nurses have the right to refuse to place patients in restraints		43 (65.2)	18 (27.3)	5 (7.6)
If I were the patient, I feel I should have the right to refuse/resist when restraints are placed on me		46 (69.7)	11 (16.7)	9 (13.6)
I feel guilty when placing a patient in restraints		41 (62.1)	15 (22.7)	10 (15.2)
In my observation, staffing shortages appear to be the primary factor driving the use of restraints in hospital settings.		31 (47)	28 (42.4)	7 (10.6)
I experience professional discomfort when family members encounter restrained patients without prior notification.		44 (66.7)	18 (27.3)	4 (6.1)
The hospital is legally responsible for using restraints to keep the patient safe		45 (68.2)	12 (18.2)	9 (13.6)
As a practitioner, I experience professional discomfort when observing heightened patient agitation following the implementation of restraint.		44 (66.7)	16 (24.2)	6 (9.1)
I feel it is important to let the patients in restraints know that I care about him or her		45 (68.2)	16 (24.2)	5 (7.6)
It seems that patients become more disoriented after restraint has been applied		33 (50)	27 (40.9)	6 (9.1)
Physical restraint use directly compromises patient dignity through autonomy loss,		51 (77.3)	11 (16.7)	4 (6.1)
I demonstrate clinical proficiency in the evidence-based care of patients who are restrained.		52 (78.8)	10 (15,2)	4 (6.1)
Total knowledge score	Mean (SD)	-	-	31 (3.6)
	Range		-	20-36

3.4. Practice Level

The total practice score had a mean of 22.7 ± 3.2 out of 34 with a range of 16 to 31. Notably, a substantial proportion of nurses (34.8%) reported only sometimes attempting alternative nursing measures before resorting to restraints, while 1.5% never attempted such measures at all. This raises serious concerns, as premature or unnecessary use of restraints may lead to patient agitation, physical harm, and ethical or legal violations. Additionally, 36.4% of nurses only sometimes conducted a thorough clinical assessment to determine the necessity of restraints, which increases the risk of inappropriate application and potential complications. Moreover, 44% of nurses did not consistently monitor restrained patients every two hours, a critical practice that, if neglected, can result in undetected circulatory problems. Communication deficits were also evident; only 37.9% of patients always received an explanation of the clinical rationale for restraint, and 13.9% were never informed of the rationale, thereby undermining informed consent and trust. Moreover, 34.8% acknowledged increased restraint use during staff shortages, suggesting reliance on restraints as a substitute for adequate staffing, which poses ethical and safety concerns (Table **5**).

3.5. Influencing Factors of Knowledge, Practice, and Attitude

A multiple linear regression analysis was conducted to examine the predictive effect of demographic and professional variables on nurses' total practice scores regarding the use of physical restraints. The model included the following independent variables: age, experience, having read about physical restraints, shift type (day/evening), night shift, percentage of time working with restrained patients, and gender.

The model was statistically significant and explained 21.4% of the variance in the total practice score ($R = 0.463$, $R^2 = 0.214$, Adjusted $R^2 = 0.120$), with a standard error of the estimate of 4.16. The overall model indicates a moderate relationship between the predictors and the dependent variable.

Among the predictors, only having read about physical restraints was statistically significant ($B = 3.475$, $p = 0.002$), suggesting that nurses who had read about restraints scored, on average, 3.48 points higher in their practice score compared to those who had not. All other predictors, including age, years of experience, shift type, and gender, were not significant contributors to the model (Table **6**).

3.6. Relationship between Knowledge, Practice, and Attitude

The correlation analysis revealed a statistically significant positive relationship between knowledge and attitude ($r = 0.627$, $p < 0.001$). However, neither the association between knowledge and practice ($r = 0.203$, $p = 0.102$) nor between attitude and practice ($r = 0.240$, $p = 0.052$) reached statistical significance (Table **7**).

4. DISCUSSION

4.1. Nurses' Knowledge about Using Physical Restraints in the ICU

This study evaluates ICU nurses' knowledge, attitudes, and practices toward the use of physical restraints and their associated factors in Jordan.

Table 5. Items of the practice questionnaire about the use of physical restraints (n=66).

Practice Item		Always	Sometimes	Never
		N (%)	N (%)	N (%)
I try alternating nursing measures before restraining the patient		42 (63.6)	23 (34.8)	1 (1.5)
I conduct a thorough clinical assessment to determine the medical necessity of restraints prior to implementation		41 (62.1)	24 (36.4)	1 (1.5)
When I feel that the patient does not need to be restrained, I make this suggestion to the physician		30 (45.5)	32 (48.5)	4 (6.1)
I prioritize immediate response to call lights or verbal requests for assistance from restrained patients		35 (53)	27 (40.9)	4 (6.1)
I check the restrained patient at least every two hours		34 (51.5)	29 (43.9)	3 (4.5)
When providing activity of daily living assistance to restrained individuals, I systematically inspect integumentary integrity for signs of pressure injuries or trauma		30 (45.5)	31 (47)	5 (7.6)
I provide patients with a clear explanation of the clinical rationale for the application of restraint.		25 (37.9)	37 (56.1)	4 (6.1)
I tell the family members/visitors why the patient is restrained		28 (42.4)	29 (43.4)	9 (13.9)
I tell the patient when the restraint will be removed		33 (50)	30 (45.5)	3 (4.5)
My practice includes informing patient relatives about the scheduled removal time of restraint devices.		35 (53)	28 (42.4)	3 (4.5)
My clinical routine incorporates clear family education regarding predetermined timelines for restraint cessation		31 (47)	28 (42.4)	7 (10.6)
All disoriented patients should be restrained		14 (21.2)	35 (53)	17 (25.8)
All intubated patients or those with arterial and venous lines should be restrained		18 (27.3)	39 (59.1)	9 (13.6)
Empirical observation reveals increased restraint application frequency during staffing shortages relative to adequately staffed periods		8 (12.1)	35 (53)	23 (34.8)
In the unit where I work, staff members work together to discover ways to control patients' behaviors other than the use of physical restraints		32 (48.5)	27 (40.9)	7 (10.6)
My clinical unit maintains an adequate restraint equipment inventory to ensure immediate availability when clinically indicated		30 (45.5)	33 (50)	3 (4.5)
I would like to sedate a patient with prospective medication rather than physically restrain them		20 (30.3)	42 (63.6)	4 (6.1)
Total knowledge score	Mean (SD)	-	22.7 (3.2)	-
	Range		16 -31	-

Table 6. Summary of linear regression analysis predicting practice score.

Predictor	B	SE	Beta	t	p	95% CI for B
(Constant)	18.111	5.952	–	3.043	0.004	6.197 to 30.025
Age	-0.034	0.188	-0.039	-0.183	0.855	-0.411 to 0.342
Experience	0.119	0.201	0.128	0.594	0.555	-0.282 to 0.520
Read about restraints	3.475	1.064	0.392	3.266	0.002*	1.345 to 5.604
Shift type	0.314	0.659	0.059	0.477	0.635	-1.005 to 1.634
Night shift	-1.350	1.297	-0.126	-1.041	0.302	-3.946 to 1.245
Percentage for using restraints	0.840	1.083	0.095	0.776	0.441	-1.328 to 3.008
Gender	-1.236	1.077	-0.139	-1.147	0.256	-3.392 to 0.920

Note: CI: Confidence Interval; SE: Standard Error. R = 0.463, R^2 = 0.214, p <.01), collinearity exists if VIF >5; here, all VIFs are below the criteria, thus excluding multicollinearity.

Table 7. Relationship between knowledge, practice, and attitude.

Variable	1. Knowledge	2. Attitude	3. Practice
1. Knowledge	1	0.627**	0.203
2. Attitude	0.627**	1	0.240†
3. Practice	0.203	0.240†	1

Note: ** Correlation is significant at the 0.01 level (2-tailed).
† Borderline significant at p = 0.052.

The present study revealed that Jordanian ICU nurses possess moderate knowledge levels regarding the utilization of physical restraints, a finding consistent with research conducted in Korea [19], Turkey [20], Ethiopia [15], and Spain [21]. However, notable exceptions emerge from the literature: Woldekirkos *et al.* [22] reported deficient knowledge levels among nurses in Addis Ababa, while Almomani *et al.* [23] documented that 51% of Jordanian nurses demonstrated inadequate knowledge related to restraints. The observed heterogeneity in

knowledge levels across international studies may be attributed to several factors: (1) variability in clinical training programs, (2) inconsistent availability of institutional protocols regarding physical restraint use, (3) methodological differences in study designs, and (4) sociocultural influences on clinical practice [15, 22, 23]. Furthermore, the lack of standardized assessment tools for evaluating restraints-related knowledge precludes direct cross-study comparisons and limits the generalizability of findings [24].

Empirical evidence from Jordan indicates limited formal training among nurses regarding physical restraints protocols [10, 23, 25]. The current study reveals that 44% of participants reported no prior exposure to didactic literature related to restraints. This pattern extends to Addis Ababa, Ethiopia, where deficient knowledge levels correlate with inadequate training opportunities [22]. While multiple studies demonstrate a significant positive association between educational exposure and restraint-related knowledge [10, 15, 22], contradictory findings report non-significant effects of training interventions [21, 26]. This discrepancy underscores the necessity for a thorough investigation into the optimal training parameters, including curricular content, instructional duration, and reinforcement frequency, as well as the mediating variables that influence knowledge acquisition and retention in clinical practice.

The current study identified several critical knowledge gaps among ICU nurses regarding physical restraints utilization, including: (1) limited awareness of evidence-based alternatives to restraints, (2) misconceptions about the appropriate indications for sheet restraints, (3) improper application techniques (*e.g.*, excessive tightening), and (4) inappropriate use when close patient monitoring is unavailable. These findings align with previous research demonstrating widespread deficiencies in nurses' knowledge of internationally recommended restraint alternatives [15, 20-23]. Notably, qualitative data reveal nurses' reluctance to implement alternative measures stems from both perceived ineffectiveness with disoriented patients and insufficient training in restraints protocols [20].

Comparative analysis of safety knowledge regarding restraint application reveals significant cross-cultural variations. While prior studies [15] reported superior nurse awareness of proper restraint tightness and supervision requirements compared to our findings, the current study demonstrated higher competency (61%) than Korean samples (11%) in recognizing contraindications for restraint use in supine positioning [19]. This discrepancy likely reflects regional practice differences, particularly Korea's predominant use of limb and wrist restraints [19]. Our results align more closely with those from Jordanian and Ethiopian studies [10, 22].

Notably, 60.6% of participants in our study correctly identified the safety precaution against attaching restraints to bed rails, outperforming comparative samples from Korea (48.7-53.3%) and Turkey (19-26%). However, the concerning finding that over one-third of nurses in the current study lacked essential safety knowledge underscores the imperative for enhanced in-service training programs to standardize evidence-based restraint practices across clinical settings.

Regarding the ethical and legal implications of restraint use, 36% of nurses in the present study were unaware that applying restraints without clinical justification could result in assault charges. This proportion exceeds the 23.3% reported by Suliman *et al*. [10] and is lower than the figure documented by Woldekirkos *et al*. [22], indicating variability in legal awareness among nursing populations. Furthermore, approximately 33% of nurses in the current study were unaware that patients retain the right to refuse restraint application, a finding consistent with prior research conducted in Jordan [10]. Notably, an even higher proportion of nurses in Turkey (68.6%) demonstrated limited awareness of this patient right. These findings suggest a widespread lack of recognition regarding patient autonomy in restraint-related decisions among nurses in Jordan and other regions.

Collectively, these observed inconsistencies in nurses' knowledge across multiple aspects of restraint utilization highlight the critical need for standardized clinical guidelines. Such guidelines would serve to consolidate currently fragmented knowledge domains and establish evidence-based best practices for implementing physical restraint.

4.2. Nurses' Attitudes regarding the Use of Physical Restraints in the ICU

Nurses in the present study exhibited significantly more positive attitudes toward the use of physical restraints compared to previous research findings [10, 15, 19, 20, 22, 26]. A majority of participants (50%) demonstrated favorable attitudes across multiple restraint-related domains, including: (1) respect for patient and family autonomy, (2) staffing and institutional considerations, (3) ethical and legal responsibilities, and (4) sensitivity to patient and family perspectives. Notably, the highest-scoring attitude items pertained to family members' right to refuse restraints (81.8%) and self-perceived knowledge in caring for restrained patients (80%).

In the present study, 80% of nurses self-reported competency in caring for restrained patients, a proportion marginally higher than rates documented by Kassew *et al*. (68%) [15]. However, the persistent discrepancy between self-reported knowledge and attitude levels across multiple studies suggests potential overestimation of clinical expertise in this domain. While 81.8% of nurses affirmed the right of family members to refuse restraint use, a clinically significant proportion (33%) across multiple studies demonstrated ethical dissonance by reporting no guilt or embarrassment when restraining patients without consulting their families [10, 15, 26, 22]. This discrepancy between ethical recognition and clinical practice not only violates principles of patient autonomy but also exposes nurses to substantial medico-legal risks.

A majority of nurses in the present study, consistent with prior research findings [10, 15, 19, 22], perceive

patient safety through restraint use as primarily falling under the realm of hospital liability. This institutional attribution of responsibility may attenuate nurses' sense of personal accountability regarding the implementation of restraints.

The generally favorable attitudes observed in this study suggest that nursing is receptive to evidence-based training initiatives. Such programs should particularly emphasize the bioethical principles and legal statutes governing the utilization of restraint to mitigate associated moral conflicts. This pedagogical approach would facilitate the development of clinically sound, ethically grounded restraint practices that holistically incorporate patient and family perspectives [19], thereby promoting more judicious use of physical restraints in clinical settings.

4.3. Nurses' Practices about Using Physical Restraints in the ICU

The current study found that nurses exhibited moderate compliance with recommended physical restraint practices, a finding consistent with research conducted in Jordan [10], Ethiopia [22], and Turkey [20]. In contrast, studies from Korea [19] and Turkey [26] reported superior practice adherence, which may be attributed to higher rates of formal restraint education among participating nurses. These cross-national variations may reflect differences in sample demographics, clinical environments, and socio-cultural contexts influencing restraint utilization patterns. Additionally, methodological disparities in practice assessment tools may contribute to observed differences, as instrument variability can significantly impact measurement outcomes in restraint-related research. The current study identified two practice items with the highest adherence scores: 63.6% of nurses reported consistently attempting alternative nursing measures prior to restraint application, while 62.1% systematically assessed restraint indications.

Comparative analysis reveals substantial international variation in the utilization of alternative measures, ranging from 36.7% in Jordan to 64.4% in Turkey [10, 22, 26]. Consistent with multiple international studies [10, 19, 22, 26], over one-third of nurses in the current study acknowledged that restraint utilization increases during staffing shortages. This finding suggests that nursing practices may be significantly influenced by systemic factors such as nurse-patient ratios. Empirical evidence supports staffing optimization as an effective strategy for reducing restraint use, whether through improved unit-level staffing ratios or the deployment of crisis response teams during periods of peak acuity [27].

Notably, approximately 50% of respondents reported inadequate unit-level collaboration in developing non-restrictive management strategies, a finding that mirrors those from prior research [10, 19, 26]. This practice gap underscores the critical need for structured training in alternative intervention protocols, as identified by nursing professionals themselves [20].

The practice items demonstrating the lowest practice rates pertained to two key misconceptions: (1) the erroneous belief that all disoriented patients require restraint (with most respondents indicating "sometimes" or "always" as their practice frequency), and (2) inappropriate restraint application for all intubated patients or those with vascular access devices. These findings reveal significant gaps in nurses' understanding of restraint indications and highlight an urgent need for targeted educational interventions to improve adherence to clinical practice guidelines regarding the use of restraints. Within this context, a quality improvement project at Christiana Care Health Services in Delaware, US, led to a multidisciplinary team successfully reducing physical restraint use across five ICUs by forming a restraint collaborative, educating staff, and introducing alternative mitts [28]. Such collaborative, nurse-led initiatives could be implemented in ICUs in Jordan to reduce restraint use while maintaining patient safety sustainably.

5. STUDY LIMITATIONS

This study has several limitations, including the use of self-reported data prone to response bias, a small convenience sample that limits generalizability and statistical power, and reliance on an instrument originally developed for nursing homes, which may reduce its relevance in ICU settings. Additionally, low Cronbach's alpha values suggest concerns about scale reliability, and the limited range of professional variables may have restricted deeper analysis of influencing factors. The study also lacked methodological triangulation. No observational or qualitative components (*e.g.*, interviews or focus groups) were included to complement and validate the self-reported data. The absence of such approaches limits deeper insights into the contextual, ethical, and emotional underpinnings of restraint-related decisions in clinical practice.

CONCLUSION

The current study, situated within a broad international body of research, reveals both consistencies and contradictions in nurses' knowledge, attitudes, and practices related to the use of physical restraints in critical care settings. Findings indicate moderate levels of knowledge and practice, with notable gaps in safety awareness and limited use of alternative interventions. A positive correlation between knowledge and attitude was observed; however, this relationship remains debated in the literature, suggesting the presence of contextual influences. These findings have significant ethical and practical implications, as inadequate knowledge and inappropriate restraint practices may jeopardize patient safety and compromise dignity.

Based on these insights, it is recommended that institutions implement ICU-specific, ethically grounded educational programs that address the multifaceted dimensions of restraint use. Interventions should include scenario-based training, clinical simulations, and structured workshops focusing on ethical, legal, and psychological considerations. To ensure sustained impact, these programs must have well-defined curricular content, set instructional durations, and periodic reinforcement. Moreover, standardized clinical guidelines tailored to ICU

settings should be developed to support consistent, evidence-based restraint practices. Adaptation and validation of assessment tools for ICU use are also necessary, considering the contextual differences from long-term care settings. Future research should investigate the effectiveness of these interventions and incorporate qualitative studies to gain a deeper understanding of the contextual factors influencing restraint-related decision-making.

AUTHORS' CONTRIBUTIONS

The authors confirm contribution to the paper as follows: L.D.: Contributed to the study's conception and design, data acquisition, and data analysis, wrote the first original draft, revised the final draft, and gave final approval of the version to be published; D.D.: Contributed to the study's literature review, data analysis, writing, review, editing, and supervision. All authors have read and agreed to the published version of the manuscript.

LIST OF ABBREVIATIONS

ICU	=	Intensive Care Unit
SD	=	Standard Deviation
M	=	Mean

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical clearance and administrative authorization were obtained prior to the commencement of data collection. This study was approved by the Ethics Committee of Al-Hussien Bin Talal University, Jordan (Number: 7/7/642, date: 31, 12, 2024).

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committees and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consents were obtained from the participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article will be available from the corresponding author [L.D] upon reasonable request.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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