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What do nursing students know about delirium? A cross-sectional study and scenario analysis

Original article

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Abstract: **Objective:** To assess the level of nursing students' knowledge about delirium and its associated risk factors. Delirium is a clinical syndrome characterized by alterations in cognition and psychomotor activity. Since delirium is common among geriatric patients, adequate preparedness of nursing students to assess and manage delirious geriatric patients is necessary to improve potential nurses' quality of care and communication with this group. Limited research work was conducted to address nursing students' knowledge about delirium.

Methods: This cross-sectional descriptive study was conducted from October 2022 to February 2023. A convenience sampling was used, and 319 valid questionnaires were obtained from nursing students from six Jordanian governmental and private universities, who were at least in their third academic year. An adopted delirium knowledge scale was used to collect data. Descriptive statistics and an independent t-test were used for data analysis.

Results: The mean for general knowledge about delirium was 57.5%. The mean for knowledge of delirium risk factors was 61.8%. Nursing students in their fourth academic year scored significantly higher on both general knowledge and risk knowledge scales than students in the third academic year.

Conclusions: Nursing students' knowledge regarding delirium and its risk factors was low. Educational efforts should be maximized for incorporating and addressing the topic of delirium in the undergraduate nursing curriculum. Implications of this study include revising nursing curricula to ensure that students receive enough education on delirium, including its detection, diagnosis, and management. The implications also include giving nursing students the chance to gain experience in caring for delirious patients and providing them with the tools and resources they need to assess and manage delirium.

Keywords: *delirium • Jordan • knowledge • nursing students • risk factors*

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1. Introduction

Delirium is a clinical syndrome characterized by alterations in the level of consciousness, attention, cognition, sleep-wake cycle, and psychomotor activity, which lead to several negative outcomes, including falls, longer hospital stays, and higher mortality rates.[1] It affects clients of different ages and different healthcare

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settings; however, elders and clients receiving care in acute and post-acute settings are more vulnerable to delirium.[2] It was suggested that delirium is often a preventable condition.[3] Several interventions can be done to reduce the risk of developing delirium, such as ensuring good sleep, encouraging mobility and self-care, and providing support.[4,5] Therefore, efforts were intensified to improve nurses' knowledge regarding delirium causes, risk factors, and clinical management. This knowledge empowers nurses and enables them to make appropriate decisions regarding delirium assessment and management.[2]

Many studies were conducted to explore nurses' knowledge regarding delirium and its risk factors. A recent study indicated inadequate knowledge among nurses regarding delirium, as 62% of participants failed to correctly identify delirium, and only 43% of participants correctly reported risk factors of delirium.[6] Furthermore, it has been found that working in intensive care units (ICU) and having a higher level of education were significant contributors to better knowledge about delirium.[6] This was congruent with the findings of another study that nurse participants had insufficient knowledge regarding clinical manifestations and types of delirium, and about 37% of participants recognized screening tools for delirium.[7]

It was pointed out that the lack of education about delirium in the nursing undergraduate curriculum is a probable contributing factor to insufficient nurses' knowledge of delirium.[8] On the other hand, it was indicated that adequate preparedness of nursing students on assessment and management of delirious geriatric clients had a positive impact on potential nurses' quality of care and communication with these clients.[8] However, most current medical curricula, particularly clinical courses, do not guarantee that students, the future nurses, get adequate knowledge about delirium, and this might contribute to students' perception of delirium care as strenuous and arduous.[9] Therefore, nurse educators should employ various learning and teaching methods in incorporating the topic of delirium in nursing curricula and associated training programs. For these training programs to be more efficacious, they should be based on the perspectives, attitudes, and misconceptions of nursing students.

To the best of our knowledge, limited research work was conducted to address nursing students' knowledge about delirium, particularly at the local level. Therefore, this study aimed to assess the level of nursing students' knowledge of delirium and its associated risk factors. Utilizing scenario analyses, the secondary aim of this study was to understand the possible outcomes based on the level of nursing students' knowledge of delirium and its associated risk factors.

2. Methods

2.1. Study design

A cross-sectional descriptive design was used. This design is appropriate because the intention was to describe the knowledge of nursing students about delirium and its risk factors.

2.2. Setting and participants

The target population of this study was nursing students from Jordanian universities. A convenience sampling strategy was used to select the participants who were nursing students from six Jordanian governmental and private nursing universities distributed over Jordan and provided a 4-year baccalaureate nursing program. Inclusion criteria were Jordanian nursing students who were at least in their third academic year.

Six Jordanian nursing schools (3 governmental and 3 private) were selected by a convenience sampling method to recruit the participants. The sample size was estimated using G*Power (version 3.1.9.4, Germany). The minimum sample size required for this study is 182, assuming a level of significance of 0.05, an effect size of 0.50, and a power of 0.80. To overcome the potential participation refusal rate, a total of 400 questionnaires were distributed to eligible nursing students. The response rate was 81% (324 nursing students). Three hundred and nineteen questionnaires were considered for data analysis, and five questionnaires were not used because of incomplete data.

2.3. Instrument and data collection

The questionnaire, which was distributed to the potential participants, included two parts: the first part was developed by the researcher and included age, gender, type of university, study pathway, and whether the topic of delirium was addressed during their study or not. The second part of the questionnaire was derived from a tool developed by Hare and others to assess the knowledge regarding delirium and its risk factors.[10] Hare's tool consists of 28 items: 14 items about the knowledge of delirium and 14 items about the risk of delirium. Each participant was asked to respond by choosing "True" or "False."

Each electronic questionnaire begins with the consent form, which includes the description and purpose of the study, confidentiality pledge, and participants' rights to participate, refuse, or withdraw from the study. After reviewing the consent form, each participant is asked to sign it and answer the questionnaire.

A pilot study was conducted with a sample of 21 nursing students to check the adequacy and appropriateness of the questionnaire. The respondents revealed that both parts of the questionnaire were easy to read, easy to comprehend, and needed an average of 16 min to be answered. A reliability analysis of the delirium knowledge assessment tool was done and showed a Cronbach's alpha of 0.82, which indicated that the tool had a good internal consistency.

This study was conducted by the ethical principles outlined in the Declaration of Helsinki. After obtaining the approval of the Institutional Review Boards (IRBs) from Jerash University (No. 2022-N-801), the researchers contacted several faculties in each participating university to assist in identifying potential participants and getting their means of communication to invite them to participate in the study. Participants were not asked to express or write their identifying data, such as their names and academic numbers, on the questionnaires.

2.4. Data analysis

The data were analyzed using SPSS Statistics 22.0 (IBM Corporation, Armonk, New York, United States). The means, standard deviations (SD), percentages, and frequencies were computed to describe participants' demographics and knowledge of delirium and its risk factors. To investigate if there are any differences in participants' knowledge of delirium and its risk factors according to participants' demographics and experiences, a two-tailed independent *t*-test and Analysis of Variance (ANOVA) were used.

3. Results

3.1. Participants' characteristics and experiences

A total of 319 Jordanian nursing students participated in this study. The mean age of participants was 25.3 years old. About 57% of participants were female. Two hundred and nineteen participants (68.7%) were in their second academic year. One hundred and ninety-five students were studying in private universities. Regarding the study pathway, about 53% of study participants were enrolled in a bridging program. More than 60% of participants stated that the condition of delirium was covered in study courses during their study (Table 1).

Variable	Frequency	Percentage (%)	Mean	SD
Age (years)			25.3	6.11
Gender				
Male	136	42.6		
Female	183	57.4		
Academic year				
Third	100	31.3		
Fourth	219	68.7		
Type of university				
Government	124	38.9		
Private	195	61.1		
Study pathway				
Regular	150	47		
Bridging	169	53		
Was the topic of delirium discussed in study courses?				
Yes	201	63		
No	118	37		

Note: SD, standard deviations.

Table 1. Participants' demographics and experiences (N = 319).

3.2. Participants' general knowledge of delirium

The overall mean of correctly answered questions was 59.7%. The mean for general knowledge questions was 57.5%. Furthermore, it has been found that 76.2% of study participants scored 50% or better for the general knowledge questions. The highest percentages of the correct answers in the general knowledge questions were for items of "Altered sleep/wake cycle may be a symptom of delirium," and "A patient with delirium is likely to be easily distracted and/or have difficulty following a conversation" with values of 89% and 86.5%, respectively. The lowest percentages of the correct answers in the general knowledge questions were for items of "Patients with delirium are always physically and/or verbally aggressive," and "A Mini-Mental Status Examination (MMSE) is the best way to diagnose delirium" with values of 13.7% and 33.2%, respectively (Table 2).

3.3. Participants' knowledge of risks for delirium

The mean for the knowledge of risk factors' questions was 61.8%. Furthermore, it has been found that 85.6% of study participants scored 50% or better for the general knowledge questions. The highest percentages of the correct answers in the general knowledge questions were for items "The risk for delirium increases with age," and "Dementia is the greatest risk factor for delirium" with values of 90% and 88.4%, respectively. The lowest percentages of the correct answers in the risks' knowledge questions were for items "A family history of dementia predisposes a patient to delirium," and "Diabetes is a high-risk factor

Item	Frequency of correct responses	Percentage of correct responses (%)
Fluctuation between orientation and disorientation is not typical of delirium (False)	141	44.2
Symptoms of depression may mimic delirium (True)	261	81.8
Treatment for delirium always includes sedation (False)	191	59.9
Patients never remember episodes of delirium (False)	96	30.1
A MMSE is the best way to diagnose delirium (False)	63	13.7
Delirium never lasts for more than a few hours (False)	179	56.1
A patient who is lethargic and difficult to rouse does not have a delirium (False)	152	47.6
Patients with delirium are always physically and/or verbally aggressive (False)	99	31.0
Delirium is generally caused by alcohol withdrawal (False)	106	33.2
Patients with delirium have a higher mortality rate (True)	215	67.4
Behavioral changes in the course of the day are typical of delirium (True)	254	79.6
A patient with delirium is likely to be easily distracted and/or have difficulty following a conversation (True)	276	86.5
Patients with delirium will often experience perceptual disturbances (True)	271	85.0
Altered sleep/wake cycle may be a symptom of delirium (True)	284	89.0

Note: MMSE, mini-mental status examination.

Table 2. Descriptive data on participants' general knowledge of delirium (N = 319).

Item	Frequency of correct responses	Percentage of correct responses (%)
A patient having a repair of a fractured neck of the femur has the same risk for delirium as a patient having an elective hip replacement	162	50.8
The risk for delirium increases with age	287	90
A patient with impaired vision is at increased risk of delirium	192	60.2
The greater the number of medications a patient is taking, the greater their risk of delirium	254	79.6
A urinary catheter in the appropriate position reduces the risk of delirium	199	62.4
Gender does not affect the development of delirium	170	53.3
Poor nutrition increases the risk of delirium	241	75.5
Dementia is the greatest risk factor for delirium	282	88.4
Males are more at risk of delirium than females	206	64.6
Diabetes is a high-risk factor for delirium	99	31
Dehydration can be a risk factor for delirium	215	67.4
Hearing impairment increases the risk of delirium	218	68.3
Obesity is a risk factor for delirium	196	61.4
A family history of dementia predisposes a patient to delirium	40	12.5

Table 3. Descriptive data on participants' knowledge of risks for delirium (N = 319).

for delirium" with values of 12.5% and 31%, respectively (Table 3).

3.4. The general knowledge of delirium: Comparison based on demographics and experiences

The findings of this study revealed that nursing students in their fourth academic year had significantly higher mean scores than students in their third academic year. Furthermore, it has been found that students who engaged in bridging study pathways scored significantly higher than those who followed regular study pathways. However, no significant differences were found based on other demographic variables and experiences (Table 4).

3.5. The knowledge of risks for delirium: Comparison based on demographics and experiences

The findings of this study revealed that the significant differences between study participants on the knowledge

Variable	N	Mean	SD	*t*	*P* value
Gender					
Male	136	8.01	2.17	−0.728	0.467
Female	183	8.19	2.00		
Academic					
Third	100	7.68	1.76	−2.538	0.012
Fourth	219	8.31	2.18		
Type of university					
Government	124	8.04	2.05	−0.497	0.619
Private	195	8.16	2.09		
Study pathway					
Regular	150	7.55	2.13	−4.683	0.000
Bridging	169	8.61	1.90		
Was the topic of delirium discussed in study courses?					
Yes	201	8.28	2.01	1.926	0.060
No	118	7.82	2.16		

Note: SD, standard deviations.

Table 4. Differences in the participants' general knowledge of delirium based on demographic variables (N = 319).

Variable	N	Mean	SD	*t*	*P* value
Gender					
Male	136	8.90	2.07	−3.238	0.398
Female	183	8.96	1.88		
Academic year					
Third	100	7.94	2.00	−4.463	0.000
Fourth	219	8.98	1.90		
Type of university					
Government	124	8.59	2.05	−0.475	0.635
Private	195	8.70	2.09		
Study pathway					
Regular	150	8.53	2.06	−1.030	0.304
Bridging	169	8.76	1.93		
Was the topic of delirium discussed in study courses?					
Yes	201	8.72	2.15	0.447	0.655
No	118	8.62	1.89		

Note: SD, standard deviations.

Table 5. Differences in the participants' knowledge of risks for delirium based on their demographics (N = 391).

of risks for delirium were based only on the academic year, in which students in the third year scored significantly lower than students in the fourth year (Table 5).

4. Discussion

The purpose of this study was to assess the level of nursing students' knowledge of delirium and its associated risk factors. The general knowledge of study participants regarding delirium was low. This was congruent with the findings of previous studies.[6,7,11,12] This might be attributed to the inadequate academic preparedness of students for the delirium condition, and this was evident as 37% of participants reported that the topic of delirium was not addressed in their study courses. Furthermore, it might be said that the inexperience of nursing students in dealing with delirious geriatric clients could be a predisposing factor to the knowledge deficit on the delirium topic.[13] Fisher and colleagues stressed the importance of incorporating knowledge, skills, and attitudes on delirium in medical curricula, to correct students' misconceptions regarding delirium.[14] This would assist in improving students' confidence and relieving uncertainty toward delirium.

The majority of study participants recognized the link between altered sleep and delirium. This might be attributed to the general perception of the high prevalence of sleep problems during late adulthood.[15] Being easily distracted was correctly identified as one of the most common manifestations among delirious geriatric clients. This perception might arise from the students' belief in the cognitive deficits that clients with delirium are experiencing.[6] It was argued that being knowledgeable about the confusion among delirious geriatric clients should be coupled with the knowledge and practice regarding the use of the best confusion assessment tools.[16] However, the participants of the current study reported the MMSE as the best tool for diagnosing delirium. This perception might stem from participants' belief in the accuracy of MMSE in detecting cognitive impairment regardless of its causes or contexts. Nevertheless, many previous studies revealed that MMSE can be used only for initial screening to rule out those who are unlikely to have delirium based on the higher score on MMSE.[17,18]

In congruence with previous studies,[18–20] the current study showed that advanced age and dementia were the most perceived risks of delirium. This might be credited to the cognitive decline associated with the aging process and dementia.

Students in their last academic year scored significantly higher on both general knowledge and risk knowledge scales. This might be because the topic of delirium is usually addressed in critical care nursing courses, which are typically involved in the path of the fourth academic year. Therefore, fourth-year students might be more exposed to information regarding delirium either in theoretical or clinical modules. Furthermore, it has been found that diploma graduate students who were enrolled in the bridging study pathway were more

knowledgeable about delirium than those who were in the regular study pathway. This might be credited either to the potential knowledge acquired while previously dealing with delirious cases during their work, or to the potential knowledge acquired during their diploma study in the community college.

This study provides beneficial data for both decision-makers and educators in the nursing and health-related academic areas by highlighting the shortcomings that exist in the knowledge of nursing students regarding delirium. Current nursing curricula should be revised to involve the recognition and management of delirium cases. Further research, particularly qualitative works, should be carried out to understand the sociocultural aspects of nursing students' experiences in dealing with delirium cases.

4.1. Scenario analyses

4.1.1. Scenario 1

A nursing student is assigned to care of an old patient with multiple comorbidities in the ICU who is at high risk for developing delirium.

Under the supervision of his/her instructor, the nursing student should be able to identify the risk factors of delirium, assess the patient for signs and symptoms of delirium, and implement preventive measures to reduce the risk of developing delirium. However, the nursing student is uncertain about the risk factors of delirium and what the signs and symptoms are. Additionally, the nursing student is unaware of delirium preventive measures. Ultimately, the patient develops delirium, which could have been prevented or, at least, detected earlier if the student had had adequate knowledge about delirium.

4.1.2. Scenario 2

A nursing student is working in a medical-surgical ward and is caring for a patient who has been newly diagnosed with delirium. The patient is confused and agitated, and he/she is refusing to eat or drink. The nursing student should identify the patient's needs and develop a nursing care plan to meet those needs, implement non-pharmacological interventions to manage this condition, and educate the patient and their family about delirium and its management. The student is aware of the causes and symptoms of delirium and is able to develop a nursing care plan and implement interventions to manage the patient's delirium. So, the student can educate the patient and their family about delirium. Ultimately, the patient's case improves, and the patient's agitation and confusion subside. The patient's overall status has improved as the patient has started eating and drinking, and malnutrition has been prevented.

4.2. Implications

This study has several implications for nursing education and practice. For instance, nursing curricula should be revised to ensure that students, the future nurses, get enough education on delirium, including its detection, diagnosis, and management. Furthermore, nursing students should also be given more chances to gain experience in caring for delirious patients. Additionally, it is important to provide nursing students with the tools and resources they need to assess and manage delirium. This includes access to evidence-based guidelines and tools, such as the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). Nursing students should also be encouraged to pursue support from experienced nurses and other healthcare professionals when caring for delirious patients. By taking these measures, we can ensure that nursing students are well prepared and have the knowledge and skills necessary to provide safe and effective care to patients with delirium.

5. Conclusions

The findings of this study suggest that nursing students, who are future nurses, have inadequate knowledge of delirium and its associated risk factors. This raises concern, as delirium is a common and serious complication that warrants hospitalization, especially in older adults. Early detection and treatment of delirium are essential to improvepatient outcomes. There are several possible reasons for the low level of knowledge among nursing students. One possibility is that this topic is not sufficiently covered in nursing curricula. Another possibility is that nursing students lack experience in dealing with delirious patients.

This study highlights the urgent need for curriculum improvement by revealing a worryingly low level of delirium knowledge among nursing students. Although the results add to the increasing body of evidence, more qualitative and interventional research is necessary to investigate the role of technology and interprofessional collaboration in optimizing delirium care, as well as to explore the underlying factors influencing knowledge disparities and develop effective educational interventions. By filling in these knowledge gaps, we can enable aspiring nurses to offer

high-quality, patient-centered care for older adults with delirium.

Ethical approval

A permission was obtained from the Institutional Review Boards (IRBs) at the Jerash University (code number: 2022-N-801). This study conforms to the principles outlined in the Declaration of Helsinki.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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