

Critical Care Nurses' Practices and Perceptions about Delirium Assessment in Saudi Arabia

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Abstract

Background: Delirium continues to be prevalent. Hence, ICU nurses are facing daunting challenges in providing timely and accurate delirium assessment. **Aim:** This study aimed to determine the barriers, perceptions, and delirium assessment practices of ICU nurses and explore which of selected participants' characteristics, assessment practices, delirium education, barriers, and perceptions are significantly associated with ICU nurses' frequency of assessing patients with delirium during an average 12 hours shift. **Materials and Methods:** This study is participated by 136 ICU nurses from two public tertiary hospitals in Riyadh, Saudi Arabia. Descriptive cross-sectional method was used in this survey using self-administered questionnaire. Descriptive statistics and Spearman rho were used in analyzing the data. **Results:** The study has 75.5% response rate. Most of the participants acknowledged presence of ICU sedation protocol specifying frequency in delirium assessment. Delirium is assessed in varying frequencies during 12 hours shift. ICU nurses considered difficulty in interpreting intubated patients, complexity in using delirium assessment tools as top barriers. They preferred using patient's ability to follow commands in assessing delirium over other delirium assessment tools. Almost 40% never received delirium education. **Conclusion:** There are gaps in delirium assessment practices, perceptions, and education that can be managed. ICU nurses need educational interventions as well as support mechanisms to enhance their confidence and competencies in assessing delirium. Institution-based delirium assessment protocols needed to be revisited and appraised for its appropriateness and applicability in current times and determine if updating is needed.

Keywords: ICU nurses; Delirium assessment practices; Perceived barriers; Delirium education; Perceptions

Introduction

Delirium is a condition characterized by an acute and fluctuating disorder involving attention and cognitive functioning triggered more often than not by underlying medical causes and is often accompanied by abnormal arousal and perceptual disturbances. [1] Delirium continues to be an ICU patients' problem with a prevalence rate of between 4% and 55% according to a systematic review of prospective cohort studies published between 2005 and 2016. [2] Another study reported that 66.6% of patients under mechanical ventilation had delirium. [3] Delirium is found to be associated with increased mortality and decreased long-term cognitive function, [4] longer ICU and hospital stays, and increased healthcare costs, [5,6] more mechanical ventilator days, and high incidence of unintentional removal of invasive devices namely endotracheal tubes and urinary catheters. [7] The aforementioned studies suggest that managing ICU patients with delirium remain a challenge because of increased vulnerability in developing more problems aside from the costs involved.

ICU nurses routinely perform comprehensive assessments to their assigned patients. While advocacies were advanced for delirium monitoring as part of best practices, actual implementation is neither widespread nor consistently performed. [8] Results from a worldwide survey participated by 1521 respondents from 47 countries revealed that delirium monitoring was implemented

in 70% of ICUs but less than half (42%) used validated delirium assessment tool. [9] Findings of a study involving five public hospitals in Turkey revealed that only 14.7% (30/204) used delirium assessment tools. [10] The findings in a literature review revealed that difficulty in assessing intubated patients, complexity of assessment tools, inability to assess sedated patients, lack of knowledge of delirium, lack of confidence with assessment tool, inability to assess sedated patients, and lack of confidence in performing the assessment among others were identified as perceived barriers in delirium assessment. [11] Timely assessments should ensure prompt recognition and introduction of appropriate interventions. [5] The forgoing studies are exposing ICU nurses with daunting challenges in providing timely and accurate delirium assessments.

In the light of the need to understand why ICU nurses apparently have limited role in evaluating delirium in ICU patients, it is important that studies continue to be conducted. There is a need for ICU Administrators and ICU Nurses to identify best

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practices based on evidence that will enable ICU nurses to practice consistency in evaluating delirium among ICU patients. Evidence-based practices should lead to the provision of safe and high quality patient care. This study therefore aimed to determine the barriers, perceptions, and assessment practices of ICU nurses when evaluating patients with delirium and explore which of selected participants' characteristics, assessment practices, delirium education, barriers, and perceptions are significantly associated with ICU nurses' frequency of assessing patients with delirium during an average 12 hours shift.

Research Methodology

Study design and population

A descriptive-cross-sectional research design was used to examine the practices, perceptions and barriers in delirium assessment among ICU nurses in two of the largest public tertiary hospitals in Riyadh, Saudi Arabia. These two hospitals were chosen since they have comparable ICU set-up wherein both have Medical-, Surgical-, and Cardiac ICUs.

The inclusion criteria include: being a full time nursing staff for at least six months; not holding managerial position; and voluntarily participates in the survey. The exclusion criteria were those with <6 months ICU experience, holding managerial position, and who do not wish to participate. The two settings have a combined population of 380 ICU nurses. This study targeted 138 ICU nurses based on 2-Tailed bivariate correlation test, medium effect size 0.3, $\alpha=0.05$, power=0.95 anchored on null hypothesis that there is no statistically significant relationship between the characteristics, perceived barriers, and delirium assessment perceptions as independent variables with ICU nurses' frequency of assessing patients with delirium during an average 12 hours shift as the dependent variable computed using G*Power 3.1.9.4. With these parameters, 180 ICU nurses were recruited using convenience sampling method to give allowance for prospective participants who may withdraw along the course of data collection. There were 136 surveys returned with complete answers yielding a response rate of 76%.

Ethical considerations

Institutional Review Board (IRB) approval to conduct this study was obtained and covered with Reference Number 17/0892/IRB and Project No. E17-2694. Explanation of the study was provided to the participants and an informed consent was obtained from each participant prior to data collection. Information that include the purpose of the study, voluntary participation, expected participation of the respondents, risks and benefits, right to withdraw from the study, and privacy and confidentiality of the participants and of the data were adequately provided to the participants.

Survey questionnaire structure, data collection and analysis

The survey is comprised of two parts. Part 1 is comprised of participants' characteristics which included age, gender, nursing education, years of ICU experience, ICU setting, hospital setting, and shift most commonly worked.

In this study, delirium is operationally defined as acutely changing or fluctuating mental status, inattention, disorganized thinking, and an altered level of consciousness.^[12] Part 2 of the survey assesses ICU nurses' assessment practices, barriers in assessing delirium, delirium education, and delirium perceptions.^[12] Assessment practices is comprised of items that include: ranking of five common ICU patient conditions that should be evaluated based on ICU nurses' average 12 hours shift; presence of sedation protocol/guideline; ICU sedation protocol specifying frequency of delirium assessment; frequency of evaluating patients for level of sedation and delirium using qualitative measure; frequency of evaluating sedation and delirium during 12 hours shift using numerical counts; and frequency of using six delirium assessment tools during 12 hours shift. Perceived barriers in delirium assessment is comprised of 10 items wherein participants rank three items they perceived as factors that prevented them from evaluating presence of delirium. Source of delirium education is comprised of four items chosen by marking a check on the item that applies to the participant. Delirium perception is comprised of eight items answerable by level of agreement or disagreement to the statements.

The validity of the questionnaire is based on jury judgment while the reliability is based on 86% test-retest agreement.^[12]

Data collection

After official approval by the IRB, Head Nurses were informed about the approval to collect data and were solicited to cascade to their ICU nurses the web link where they can access the informed consent and the questionnaire for the survey. The web link contained the information about the study. Nurses who were eligible were asked for their voluntary participation in the online survey and sign the consent electronically. Once the participants agreed to participate, they were redirected to the survey. Series of reminders were sent via e-mail to the head nurses at biweekly intervals.

Data analysis

Data were analyzed using IBM's SPSS version 23. Descriptive statistics was used in presenting participants' characteristics, delirium assessment practices, barriers, perceptions, and source of delirium education. Spearman rank correlation coefficient (rs) was used to determine presence of statistically significant relationship between participants' characteristics, delirium evaluation practices, barriers, perceptions, and source of delirium education with ICU nurses' frequency of assessing patients with delirium during an average 12 hours shift wherein response categories 2-3 times, 4-6 times, and >6 times were collapsed into ≥ 2 -3 times to make up a third response category aside from 0=Never, and once. Bootstrapping using 1000 samples was applied to address bias in the data. Significant findings were inferred if $P<0.05$.

Results

Characteristics of participants

There were 136 surveys included in the final analysis providing

a response rate of 75.5% (136/180). Most, 95.6% (130/136) of the participants were female; 62.5% (85/136) have BSN degree, 66.2% (90/136) worked in ICU for six years or more; 61% (83/136) worked in Cardiac ICU; 55% (75/136) in Hospital 2; and 89.7% (122/136) worked in rotating day or night shifts. The Mean (SD) age is 34.3(6.6) [Table 1].

Delirium evaluation practices

Most 94.9% (129/136) responded that their hospitals have ICU sedation protocol/guideline. Likewise, 81.6% (111/136) have ICU sedation protocol specifying frequency in assessing delirium. ICU patient conditions ranked most important to be assessed by ICU nurses during their average shift are: presence of altered level of consciousness, 61.7% (84/136) and presence of pain 53.6% (73/136). Most, 63.2% (86/136) conducted delirium assessment ≥ 2 -3 times during their 12 hours shift. Half, 50% (68/136) obtained delirium education through in-service seminars. The delirium assessment method used frequently or always is ability to follow commands 40.4% (55/136). Most never used Clinical Institute Withdrawal of Alcohol Scale 84.6% (115/136); Psychiatry consultation 79.4% (108/136); and Intensive Care Delirium Screening Checklist 71.3% (97/136). It is notable that Confusion Assessment Method-ICU was never used by 46.3% (63/136) and rarely used by 36% (49/136). [Table 2].

ICU nurses' delirium education

About 39.7% (54/136) never received delirium education. About half acquired delirium education through live, in-hospital or in-service lecture. About 34.6% (47/136) perceived that teaching at bedside tool improves delirium outcome [Table 2].

Perceived barriers in delirium evaluation

Factors that might prevent ICU nurses from assessing delirium

that have the most first rank include: difficulty in interpreting intubated patients 44.1% (60/136); inability to complete assessment in sedated patients 34.6% (47/136); and delirium assessment tools are too complex to use 23.5% (32/136). Inability to complete assessment in the sedated patient has the most 2nd rank 25.0% (34/136). Not enough time to perform assessment (tool time consuming) has the most 3rd rank 30.9% (42/136) [Table 3].

ICU nurses' perceptions in delirium evaluation

The top four items representing delirium assessment perceptions of ICU nurses rated with strong or moderate agreement by at least are: delirium is a problem that requires active interventions on the part of caregivers 91.9% (125/136); delirium is common response to the ICU environment 86.7% (118/136); delirium is challenging to assess in ICU patients 86.7% (118/136); and patients with delirium usually have symptoms that are consistent over the entire nursing shift 75.7% (103/136). On the other hand, ICU patients with delirium are rarely agitated 47.1% (64/136) and delirium is associated with higher patient mortality 45.5% (62/136) had the most strongly-moderately disagree ratings [Table 4].

Results of test for significant correlations

Only items that have statistically significant relationship with the frequency of delirium assessment during 12 hours shift were included in the analysis. Among participants' characteristics, years of ICU experience, $r_s=0.18$, $P=0.04$; ICU setting $r_s=-0.32$, $P<0.001$; and hospital setting $r_s=-0.39$, $P<0.001$ have statistically significant correlation with frequency of delirium assessment during 12 hours shift.

Among delirium assessment practices importance in evaluating

Table 1: Characteristics of participants (N = 136).

Characteristics	f	%
Gender	Male	4.4
	Female	95.6
Nursing degree	Diploma	37.5
	BSN	62.5
Length of ICU experience	< 1 year	5.9
	1-5	27.9
	6-10	39.0
	11-15	17.6
	> 15	9.6
	≤ 5 years	33.8
Length of ICU experience - Recoded	Between 6 and 10 yrs	39.0
	≥ 11 years	27.2
ICU Setting	Medical	30.9
	Surgical	8.1
	Cardiac	61.0
Hospital setting	Hospital 1	44.9
	Hospital 2	55.1
Commonly worked shift	Permanent Day	8.8
	Permanent Night	1.5
	Rotating day or night	89.7
Age (years)	Mean = 34.3; Standard deviation = 6.6	

Table 2: Delirium assessment practices (N = 136).

Sedation and delirium assessment practices		f	%			
ICU with sedation protocol/guideline	Yes	129	94.9			
	No	5	3.7			
	Not sure	2	1.5			
ICU sedation protocol specifying frequency in assessing delirium	Yes	111	81.6			
	No	11	8.1			
	Not Sure	14	10.3			
Ranking of ICU patient conditions considered most important by ICU nurses to be assessed during average shift	1st Altered level of consciousness	84	61.7			
	2nd Presence of pain	73	53.6			
	3rd Improper placement of invasive devices	50	36.7			
	4th Presence of delirium	48	35.2			
	5th Presence of agitation	43	31.6			
Frequency of delirium assessment during 12 hour shift	0	14	10.3			
	1x	36	26.5			
	2-3x	51	37.5			
	4-6x	16	11.8			
Frequency of delirium assessment during 12 hour shift (Recoded)	> 6x	19	14.0			
	0 or Never	14	10.3			
	1x or Once	36	26.5			
	≥2-3 times	86	63.2			
Mode of delirium assessment education	Have never received delirium education	54	39.7			
	Live, in-hospital or in-service lecture	68	50.0			
	Teaching at the bedside tool improves delirium outcome	47	34.6			
Delirium assessment method used	Live, out-of-hospital CE lecture	13	9.6			
	Never Used	Rarely used	Used Frequently-Always			
	f	%	f	%	f	%
Ability to follow commands	45	33.1	36	26.5	55	40.4
Agitated related events	61	44.9	37	27.2	38	27.9
Confusion Assessment Method (CAM-ICU)	63	46.3	49	36.0	24	17.6
Intensive Care Delirium Screening Checklist	97	71.3	27	19.9	12	8.8
Clinical Institute Withdrawal of Alcohol Scale	115	84.6	16	11.8	5	3.7
Psychiatry consultation	108	79.4	25	18.4	3	2.2

Table 3: Ranking of factors perceived as barriers in delirium assessment (N = 136).

Variables	Rank		
	First n (%)	Second n (%)	Third n (%)
Difficult to interpret intubated patients	60 (44.1)	32 (23.5)	10 (7.4)
Inability to complete assessment in the sedated patient	47 (34.6)	34 (25.0)	20 (14.7)
Delirium assessment tools are too complex to use	32 (23.5)	28 (20.6)	35 (25.7)
Inability to adequately document delirium assessment	29 (21.3)	33 (24.3)	28 (20.6)
Do not feel that using delirium assessment tool improves outcomes	27 (19.9)	19 (14.0)	40 (29.4)
Physicians do not use my assessment in their decision-making	26 (19.1)	15 (11.0)	22 (16.2)
Not enough time to perform assessment (tool time consuming)	25 (18.4)	17 (12.5)	42 (30.9)
Do not feel confident in my ability to use delirium assessment tools	24 (17.6)	20 (14.7)	40 (29.4)
Physicians already complete delirium assessment	24 (17.6)	12 (8.8)	19 (14.0)
Nurses are not required to screen for delirium in my ICU	17 (12.5)	18 (13.2)	34 (25.0)

improper placement of invasive devices $r_s = -.28$, $P < 0.01$; importance in evaluating presence of agitation $r_s = -.20$, $P = 0.01$; ICU sedation protocol specifying frequency of delirium assessment $r_s = -.19$, $P = 0.03$; use of Confusion Assessment Method-ICU (CAM-ICU) $r_s = 0.26$, $P < 0.01$; and use of CIWA-Ar scale $r_s = -.30$, $P < 0.001$ are statistically and significantly associated with frequency of delirium assessment during 12 hours shift.

Among sources of delirium education have never received delirium education $r_s = 0.28$, $P < 0.01$; live, in-hospital lecture or in-service delirium lecture $r_s = 0.35$, $P < 0.001$; and teaching at bedside tool improves delirium outcome $r_s = -.36$, $P < 0.001$ are statistically and significantly associated with frequency of delirium assessment during 12 hours shift.

Among delirium assessment perceptions, delirium is a

common response to the ICU environment $r_s = -0.17$, $P = 0.04$ is statistically and significantly associated with frequency of delirium assessment during 12 hours shift. Among perceived delirium assessment barriers: inability to complete assessment in delirium patient $r_s = -0.19$, $P = 0.02$; delirium assessment tools are too complex to use $r_s = 0.22$, $P < 0.01$; do not feel confident in my ability to use delirium assessment tools $r_s = 0.25$, $P < 0.01$; and do not feel that using delirium assessment tool improves outcomes $r_s = 0.32$, $P < 0.001$ are statistically and significantly associated with frequency of delirium assessment during 12 hours shift [Table 5].

Discussion

The findings in this study indicated that ICU nurses acknowledged the presence of ICU sedation protocol specifying delirium assessment frequency. In the absence of information on the actual guideline, analysis of the results is limited to the survey responses. While 81.6% acknowledged that there is presence of delirium assessment frequency protocol, delirium is inconsistently assessed ranging between never (10%) to once (26.5%) and 2-3 to six times (combined 63.2%). This variation may be attributed to the varying conditions presented by ICU patients as shown in the spread by which the five ICU patient conditions were ranked. It appeared that ICU nurses prioritized assessment of patients with altered level of consciousness and presence of pain. It is notable that assessment for presence of delirium is ranked fourth important among the five conditions. Furthermore, among the five conditions, importance in evaluating improper placement of invasive devices and presence of agitation were the only conditions significantly associated with the frequency of delirium assessment despite of being ranked third and fifth respectively in the importance of assessment. Even though there is similarity with the ranking of importance in assessing these five conditions with that of Devlin et al.'s [12] survey, ICU nurses in the current study provided higher ratings on the importance of assessing the five ICU patient conditions. The current findings may be better than the findings in another study wherein delirium assessment was underestimated [6] and considered as low in priority in another study. [13]

Another key finding in delirium assessment practices is on how delirium assessment tools were used. Apparently, ICU nurses in

this study relied in using ability of patients to follow command although less than half of them used it. It is notable that most of the participants never used Clinical Institute Withdrawal of Alcohol Scale (CIWA-Ar) (84.6%), psychiatry consultation (79.4%), Intensive Care Delirium Screening Checklist (71.3%). CAM-ICU (46.3%) is fourth among the methods never used. The high proportion of those who never used CIWA may be understandable in this study since alcohol consumption is prohibited in the country. These results are comparable in terms of ordered sequence in which these assessment tools were used but at lower usage rate compared with the findings of Devlin et al. [12] About 39.7% (54/136) never received delirium education. Live, in-hospital lecture is the main source of delirium education in this study which is also almost similar with that of Devlin et al. [12] survey. When taken on a whole, delirium assessment practices in this study apparently are undertaken on the basis of patients need or patient's condition and perhaps nurses' limitations. Additionally, it seemed that participants in the current study may need further training in the use of specialized delirium assessment tools like the use of CAM-ICU and Intensive Care Delirium Screening Checklist owing to high proportion of participants who never used these two tools and a high proportion of participants who have no delirium education. Studies have shown that educational interventions with hands-on training are effective in equipping nurses with appropriate knowledge and skills in managing patients with delirium. [14] Since the participants acknowledged that their ICUs have delirium assessment guidelines, there is need to review its implementation and compliance. According to Elliott, [15] delirium guidelines has been recognized as important reference in ICU. Hence, the institution-based guidelines should provide significant contribution if it were clearly understood and implemented. Institution-based guidelines also need to be evaluated for its applicability or updating.

The participants ranked difficulty in interpreting intubated patients, inability to complete assessment in sedated patients, and complexity in using delirium assessment tools as the top three barriers in assessing delirium. This finding is likewise similar with that of Devlin et al. [11,12] The complexity in using delirium assessment tools is found to be significantly associated with use of CAM-ICU. This association may have a bearing

Table 4: ICU nurses' perceptions in delirium assessment (N = 136).

Variables	Strongly / Moderately Agree	Strongly / Moderately Disagree	Neither Agree nor Disagree
	n (%)	n (%)	n (%)
Delirium is a problem that requires active interventions on the part of caregivers.	125 (91.9)	8 (5.8)	3 (2.2)
Delirium is a common response to the ICU environment	118 (86.7)	15 (11.0)	3 (2.2)
Delirium is challenging to assess in ICU patients.	118 (86.7)	11 (8.1)	7 (5.1)
Patients with delirium usually have symptoms that are consistent over the entire nursing shift.	103 (75.7)	19 (13.9)	14 (10.2)
Initiation of antipsychotic therapy (e.g., Haldol) should be the initial intervention for all patients with delirium	89 (65.4)	33 (24.2)	14 (10.2)
Delirium is an underdiagnosed problem	83 (61.1)	41 (30.1)	12 (8.8)
ICU patients with delirium are rarely agitated	63 (46.3)	64 (47.1)	9 (6.6)
Delirium is associated with higher patient mortality	61 (44.8)	62 (45.5)	13 (9.5)

Table 5: Results of bivariate correlations (N = 136).

Variables	rs	P-value	†BCa95% CI	
			Lower	Upper
Frequency of delirium evaluation during 12 hour shift	1.000			
Participants' characteristics				
Years of ICU experience	.18	0.04	.01	.34
ICU setting	-.32	<0.001	-.45	-.19
Hospital setting	-.39	<0.001	-.53	-.24
Delirium assessment practices				
Importance in evaluating improper placement of invasive devices	-.28	<0.01	-.44	-.13
Importance in evaluating presence of agitation	-.20	0.01	-.37	-.03
ICU sedation protocol specifying frequency of delirium assessment	-.19	0.03	-.38	.01
Use of Confusion Assessment Method-ICU (CAM-ICU)	.26	<0.01	.08	.42
Use of CIWA-Ar scale	-.30	<0.001	-.47	-.12
Source of delirium education				
Have never received delirium education	.28	<0.01	.11	.45
Live, in-hospital lecture or in-service delirium lecture	.35	<0.001	-.49	-.20
Teaching at bedside tool improves delirium outcome	-.36	<0.001	-.48	-.22
Delirium assessment perception				
Delirium is a common response to the ICU environment	-.17	0.04	-.34	.01
Perceived delirium assessment barriers:				
Inability to complete assessment in sedated patient.	-.19	0.02	-.34	-.03
Delirium assessment tools are too complex to use	.22	<0.01	.07	.36
Do not feel confident in my ability to use delirium assessment tools	.25	<0.01	.08	.38
Do not feel that using delirium assessment tool improves outcomes	.32	<0.001	.16	.45

on the low usage of CAM-ICU among the participants and a contributory factor why nurses in this study preferred to use patients' ability to follow command in assessing delirium. However, if ICU nurses continue to refrain from using valid delirium-specific assessment tools, presence of delirium may have been missed. Another reason why there is low usage of CAM-ICU may be an apparent low regard among ICU nurses in using CAM-ICU.^[16] Educational interventions are therefore needed to enhance ICU nurses' knowledge and skills in using delirium specific assessment tools.

Participants in the current study positively acknowledge that delirium is: a problem that requires active interventions on the part of caregivers; common response to the ICU environment; and challenging to assess in ICU patients. These perceptions are positive indications that ICU nurses in this study are aware of the importance of assessing delirium. Seemingly, there may be other factors that were not included in this study that contributed to the limitations by the participants in consistently monitoring for signs of delirium. Closer examination of the practices, perceived barriers, delirium education, and perceptions rated by the participants apparently revealed that there are gaps that can be addressed. It is recommended that further studies be conducted to uncover underlying reasons why delirium assessment by ICU nurses is erratic. An in-depth interview or focus group discussion would complement quantitative surveys to find out the underlying issues or limitations that ICU nurses are confronted with. Assessment of ICU nurses' predicaments and needs should be conducted before appropriate interventions can be implemented. Upfront, ICU nurses in this study apparently need support mechanisms or interventions that will enhance their confidence and competencies to better and

consistently assess delirium anchored in culture-sensitiveness and coupled with patient and significant others' participation. This would hopefully contribute in the reduction of patient ICU stay and better prognosis. Advocating for interdisciplinary and collaborative approach in managing patients with delirium would significantly contribute in enhancing confidence and competencies in early delirium detection and early management.

Conclusion

The results of this study indicated that there are gaps in delirium assessment practices, perceptions, and education that can be managed. ICU nurses need educational interventions as well as support mechanisms to enhance their confidence and competencies in delirium assessment particularly in using valid and reliable delirium-specific tools that are likewise culture sensitive. Institution-based delirium assessment protocols needed to be revisited and appraised for its appropriateness and applicability in current times and determine if updating is needed.

Limitations

The study was conducted in two public tertiary hospitals therefore generalization of the findings would not be feasible. There may be variables that were not included in the current study that could have provided more insights in the practices and perceptions of ICU nurses in delirium assessment. The actual delirium assessment protocol that were used in the actual settings would have contributed in the study had it been included in the survey for purposes of evaluating its implementation and adherence to the guidelines.

Competing Interests

The authors declare that they have no competing interests.

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