Emergency Nurses' Perceptions of Risk for Firearm Injury and its Effect on Assessment Practices: A Mixed Methods Study

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CE Earn Up to 7.5 Hours. See page 112.

Contribution to Emergency Nursing Practice

- The current state of scientific knowledge on emergency nursing process around assessment of access to in-home firearms indicates that this risk factor for injury is under-assessed.
- The main findings of this research are that emergency nurses report not screening for access to in-home firearms because of unclear paths to action and because they fear violent responses from their patients.
- Key implications for emergency nursing practice from this research are the need for education of emergency nurses regarding the importance of firearms assessment, assessment techniques, and available resources. Concerns related to violence in the emergency setting should also be addressed.

Abstract

Introduction: Injury from firearms is a significant problem in the United States, accounting for 73% of all homicides and 50% of all suicides that occurred among US residents. What is not known are the perceptions of emergency nurses regarding the impact of in-home access on the risk for firearm-related injury and death in their patient populations. The purpose of this study was to explore emergency nurses' perception of patient risk for firearm injury and in which ways that perception affected the process of ED patient screening, assessment, counseling, and discharge education.

Methods: We employed a mixed methods, sequential, explanatory design using quantitative survey data and qualitative focus-group data.

Results: Between 21.8 and 43.5% of respondents reported asking patients about access to in-home firearms, depending on presentation. Statistical analyses showed the single most significant factor correlated with nurses asking about the availability of a staff person who could further assess risk and offer assistance and safety counseling to patients. Another important influence was identified from focus-group discussions in which nurses reported that they felt challenged to bring up the topic of firearms in a way that did not seem confrontational.

Discussion: Access to firearms poses risk to patients, and patient safety and the continuum of care depends upon the emergency nurse assessing patient firearms risk and taking appropriate action. The findings from this study suggest that emergency departments (1) normalize and standardize the assessment of firearms, (2) designate an ED staff member

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on each shift to further assess risk if a positive response is elicited, and (3) continue to improve workplace safety.

Key words: Emergency care; Mixed methods; Firearms; Lethal means assessment; Workplace safety; Nursing workload

Introduction

Injury from firearms is a significant problem in the United States. In 2015, firearms deaths represented 73% (12,979) of all homicides and 50% (22,018) of all suicides that occurred among US residents during that year.[1] In addition, in 2014, 81,034 Americans were treated in hospital emergency departments for nonfatal gunshot wounds.[2]

Both the US Surgeon General and the World Health Organization have identified restriction to lethal means (defined as implements, substances, weapons, or actions capable of causing death in a person with suicidal ideation) as an important strategy for prevention of suicide.[3] Up to 90% of firearm suicide attempts result in death, and lethal-means restriction of this particularly fatal method has been found to lower both firearm-caused suicide and overall rates of suicide,[3] with the greatest effects among children ages 0 to 19.[4] Yet many ED providers are skeptical about the preventability of suicide and the effectiveness of lethal-means restriction.[3] Betz et al[5] found that most ED providers do not assess suicidal patients' firearm access except when a patient has an explicit suicide plan that involves the use of firearms. In an earlier study, Betz et al[6] found that although two thirds of respondents believed that ED providers should always ask suicidal patients about access to firearms, more than half of the respondents (52%) reported rarely or never doing so; these findings are consistent with the results of a recent meta-analysis indicating the risk of completed suicide increases more than 3-fold when people have access to firearms.[7]

Simonetti et al[8] examined a pediatric population, for which access to in-home firearms is an independent risk factor for suicide. One in 3 respondents (29.1%, n = 2,778) in their survey sample reported living in a home with a firearm, of whom 40.9% reported easy access to and the ability to discharge that firearm.[8] Among adolescents, 82% of suicides involved guns belonging to family members,[9] yet during ED psychiatric evaluation of high-risk pediatric patients, firearm ownership or access is rarely documented.[10] A lethal-means assessment of all suicidal patients who visit the emergency department is recommended by the Education Development Center Suicide Prevention Resource Center national guidelines,[11] as researchers suggest that the immediate opportunity for prevention compels ED physicians to screen for and counsel at-risk patients.[12] Importantly, a recent study by Betz and colleagues, in which a universal suicide screening protocol was implemented, demonstrated a nearly 2-fold increase in detection of suicide risk.[13]

Similarly, Sorenson and Wiebe[14] suggest that patients who present to the emergency department with injuries from intimate-partner violence (IPV) should be assessed for the presence of firearms in the home. Despite a general emphasis on danger posed by strangers, intimate partners with guns pose the greatest risk of fatal violence to women.[15,16]

What remains unknown is how emergency nurses perceive the impact of access to in-home firearms on the risk for firearm-related injury and death in the ED patient population. The purpose of this study was to explore personal and environmental factors in emergency nurses' perceptions of patient risk for firearm injury and how these perceptions affected the process of ED patient screening, assessment, counseling, and provision of discharge education.

Methods

This study employed a mixed methods, sequential, explanatory design,[17] which allows diverse perspectives of participants to be clarified and understood. There is scant literature on the process by which emergency nurses assess for access to in-home firearms, and so a mixed methods approach provides a broader and deeper understanding of this understudied phenomenon. To get a broad initial snapshot of the phenomenon, we collected quantitative survey data first and used those data to develop focus-group questions producing qualitative feedback that, once analyzed, would elaborate on—and help explain and interpret—the quantitative survey data.[17] Quantitative and qualitative data were analyzed separately and then given equal priority during the data-interpretation phase.

RESEARCH QUESTIONS

- Q1: What level of risk for firearms injury do emergency nurses assign to various patient groups, based on their patient assessments?
- Q2: In what ways do emergency nurses assess for access to in-home firearms in various patient groups?
- Q3: Do emergency nurses have different responses to confirmed firearm access, depending on the patient group?

Q4: Is there a relationship between nursing demographics and likelihood of asking about the presence of—or access to—firearms for various patient populations?

Data Collection

QUANTITATIVE (SURVEY)

The survey was based on research recommendations in the current literature and questions from a modified version of the American Academy of Pediatrics (AAP) Omnibus Periodic Survey of Fellows on prevention of firearm injury[18] (Tables 1-3). The original AAP instrument was adapted by Gomez in 2013[19] to investigate emergency nurses' attitudes, knowledge, and prevention practices regarding firearm injury and safety for youth who visited emergency departments located in the Midwestern United States. Our study addressed both youth and adult ED patients and included questions from the modified survey that addressed the frequency of caring for someone with a firearm injury during the last 12 months and the conditions and frequency with which this group of emergency nurses conducted 4 firearm safety tasks with patients: screening, assessment, risk reduction counseling, and firearm safety education. We also asked whether any of these firearm safety tasks were part of routine care (more than 50% of patient visits) for specific patient groups (stratified by age, gender, and risk factors) who may have an elevated risk for firearm-related injury and death (Table 2). Instrument review and inter-rater agreement by a statistician and 5 emergency nursing professionals who have expertise in quality, safety, and research helped to further establish face and content validity for this study with emergency nurses; they suggested adding 3 items to elicit information about (1) whether the emergency department had a policy prohibiting providers from asking about in-home access to firearms; (2) the ability of the triage nurse to "hand off" at-risk patients to the primary nurse for further assessment and counseling; and (3) if the survey respondent had ever received firearm safety training in their hospital or elsewhere.

In addition, 5-point Likert scales (strongly agree to strongly disagree) were used to measure knowledge about firearms laws and attitudes toward guns (ATG) based on previously reported validity/reliability tests conducted by AAP (2010) and other researchers who developed these scales for use with college students[20,21] (Table 3). The survey was reviewed again by the statistician and the 5 expert emergency nursing professionals to further establish face and content validity for this study with emergency nurses. Construct validity is further discussed in the results section. A demographic data sheet was also included in the survey email to determine information specific to both the nurse (eg, location, education, age, and experience) and the facility (eg, region, trauma center designation, setting, and number of visits per year) (Tables 4 and 5). Survey data were collected online using Qualtrics software (Qualtrics, Provo, Utah) during the months of February and March of 2017. A blast E-mail was sent to 31,119 opt-in members, followed by 2 reminder E-mails at 2-week intervals.

TABLE 1
Factors in deciding to ask about firearms Survey Question: How significant are each of the following factors in your decision to ask (or not ask) a patient about in-home access to firearms? (By percentage of respondents, N = 1,424)*

	Not at all significant	Somewhat significant	Highly significant
Patient's attitude about gun ownership	59.1%	25.8%	15.1%
My own attitudes about gun ownership	66.9%	18.4%	14.6%
ED colleagues' attitudes about gun ownership	75.8%	18.3%	5.9%
Prevailing attitudes of local residents about gun ownership	61.2%	24.2%	14.7%
State and local laws regulating gun ownership	54.4%	26.0%	19.6%
Societal opinions that view gun ownership as a private matter	58.8%	24.7%	16.5%
New stories about incidents of gun violence in my community	57.5%	27.6%	14.9%

* Some rows may not equal 100% because of rounding.

TABLE 2

Firearms safety tasks Survey Question: When considering the risk for firearm injury or death, indicate the firearm safety tasks that are part of your regular care for each patient population listed below. (Note: Regular care means at least 50% of your patient visits.) Data from this question were used to construct the Firearm Treatment Task Rating and the At-Risk Population Action Level, DV2 and DV3 in the regression modeling, which can be found in the Online Supplement. (By percentage of respondents, N = 1,424)*

	Screen to identify risk (e.g., if patient is suicidal)	Assess level of risk (e.g., if firearms are present in the home)	Counsel to reduce risk (e.g., removal of firearms from home)	Include risk reduction strategies in discharge instructions (e.g., safer storage of firearms)	I do not conduct any of the tasks listed for this population
Current/past history of substance abuse	59.2%	8.7%	1.9%	1.5%	28.8%
Current/past history of violent behavior	50.4%	17.0%	3.6%	2.5%	26.4%
Current/past history of intimate partner violence	42.7%	19.9%	5.0%	3.2%	29.1%
Current/past history of gang violence	34.1%	15.5%	3.6%	3.3%	43.5%
Current/past history of firearm injury	36.9%	16.9%	6.1%	6.8%	33.3%
Current/past history of behavioral health diagnosis	56.1%	14.6%	5.0%	2.5%	21.8%
Pediatric patients (under 13 years) [M/F]	14.7%/14.3%	4.6%/4.4%	2.9%/2.6%	3.0%/2.7%	N/A
Adolescent patients (13–24 years) [M/F]	17.7%/17.3%	5.9%/5.3%	3.1%/2.8%	3.5%/3.2%	N/A
Adult patients (25–64 years) [M/F]	17.7%/17.2%	5.8%/5.2%	2.9%/2.5%	3.6%/3.2%	N/A
Older adult patients (64+ years) [M/F]	16.2%/15.5%	4.2%/3.8%	1.7%/1.4%	2.1%/1.9%	N/A

* Some rows may not equal 100% because of rounding.

QUALITATIVE (FOCUS GROUP)

Two focus groups were held at a national conference in September 2017. A total of 25 emergency nurses participated. The study was deemed to be exempt from oversight by the Chesapeake Internal Review Board (IRB); nevertheless, a Certificate of Confidentiality was obtained from the National Institutes of Health to ensure that participants could speak freely. A Certificate of Confidentiality provides participants the confidence that their identifying information and/or the information they disclosed during the focus-group discussion is protected and cannot be "discovered" or provided for use in any federal; state; or local civil, criminal, administrative, legislative, or other legal proceeding. Focus-group sessions lasted approximately 1 hour each, were audio-recorded, and the researchers took field notes during the sessions. Questions asked of the focus groups were derived specifically to explicate the survey findings and included "Under what conditions do you ask (or not ask) about the presence of firearms," and, more importantly, "what do you do with that answer if you ask?" Further questions were based on the conversation

TABLE 3
Knowledge, attitudes, and beliefs Survey Question: How strongly do you agree or disagree with each of the following statements? (By percentage of respondents, N = 1,424)*

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Gun violence is a problem in the community where my emergency department is located.	28.3%	26.9%	12.6%	17.7%	14.5%
People should be allowed to have handguns in their homes.	58.7%	19.0%	13.0%	4.9%	4.5%
Regardless of the potential for injury, everyone has the right to own a gun.	38.4%	21.5%	11.8%	14.4%	13.9%
Emergency nurses should ask all patients about the presence of firearms in the home.	12.3%	18.3%	27.5%	17.3%	24.6%
I am comfortable discussing firearm safety with patients and families.	35.5%	28.4%	16.1%	12.8%	7.2%
I have received adequate professional education in firearm safety.	21.8%	10.4%	10.3%	18.6%	38.8%
There is sufficient time during an ED visit to discuss firearm safety with patients.	4.5%	11.2%	14.7%	30.3%	39.2%
Patients resent the intrusion of being asked about the presence of firearms in the home.	22.3%	34.9%	31.9%	7.9%	3.0%
The number of completed suicides is high because handguns are readily available.	5.9%	11.6%	24.7%	23.3%	34.6%

continued

TABLE 3
Continued

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Many murders would not take place if handguns were not so readily available.	13.3%	17.5%	15.9%	19.6%	33.7%
When you have a handgun of your own, you can stop worrying about being a victim of violence.	2.2%	9.8%	15.0%	22.1%	50.9%

* Some rows may not equal 100% because of rounding.

and asked for explication of statements and/or clarification from participants. The transcribed recordings and the field notes served as the data set. Saturation was evaluated after each focus group; the PI summarized the conversation for the participants, allowing them to add or clarify any comments and allowing the researchers to determine if saturation had been met. Confirmation occurred when the focus-group data had been analyzed and interpreted; those findings were presented to participants via e-mail with a second opportunity to add, amend, or clarify their understanding of the phenomenon of interest. Ten of the 25 participants responded to an E-mail asking for confirmation of findings. All participants confirmed the overall accuracy of the interpretation, and only a minor refinement was made for clarification based on participant feedback.

Data Analysis

QUANTITATIVE (SURVEY)

Survey data were exported to an SPSS database. Descriptive and correlational analyses and multiple logistic and linear regression modeling were performed.[22] Dependent variables (DVs) were as follows: (DV1) A Yes/No response to a general question concerning whether the nurse ever inquired about firearms. (DV2) The Firearm Treatment Task Rating (FTTR, alpha = 0.77). An average of 5 frequency ratings, measuring the overall rate of use of 5 treatment tasks related to firearms inquiry (Table 2; and [DV3] The At Risk Population Action Level (ARPAL, alpha = 0.91). An average of the level of firearm intervention that is part of the nurse's regular care for 6 populations that may be regarded as particlarly at risk (Table 2).

QUALITATIVE (FOCUS GROUPS)

The qualitative arm of this study used a methodology called situational analysis[23] that employs visual mapping derived from the data to describe the type and relationship of elements in the studied phenomenon. Situational maps lay out the main human and nonhuman elements and examine relationships between them; social worlds maps describe the actors, key nonhuman elements, and the areas of commitment within which they engage.[23] Positional maps describe the major positions taken (and not taken) on complicated issues regarding the phenomenon of interest. Most significantly, the positional maps describe so-called areas of silence, which can be critical to understanding what is not openly acknowledged in the discussion of the phenomenon of interest.[23] Several of the researchers derived situational and positional maps during the situational analysis process while reading and rereading the verbatim focus-group transcripts. These maps were compared, and a final situational map evolved and included human element, social world, and positional maps. These maps were used to provide the analyzed qualitative data that were used along with the quantitative data in the data-triangulation process to help clarify and confirm the study findings.

TABLE 4
Participants' demographics

	Survey (%) (n = 1,424)	Focus Groups (%) (n = 25)
Gender		
Male	21.6%	24.0%
Female	78.2%	76.0%
Other	0.1%	0.0%
Age		
18–24	1.3%	0.0%
25–34	18.8%	4.0%
35–44	25.0%	24.0%
45–54	26.0%	16.0%
55–64	24.3%	56.0%
>64	4.4%	0.0%
Missing	0.2%	0.0%
Primary ED Role		
Charge Nurse	14.6%	12.0%
Clinical Coordinator	2.2%	4.0%
Clinical/Nurse Educator	6.7%	24.0%
Clinical Nurse Specialist	1.6%	4.0%
Director	6.0%	12.0%
Manager	6.5%	8.0%
Nurse Practitioner	1.9%	0.0%
Staff Nurse	51.3%	32.0%
Trauma Coordinator	3.2%	4.0%
Other	6.0%	0.0%
Years of Experience	Mean (SD)	Mean (SD)
As a nurse in all areas	19.2 (12.8)	25.0 (12.8)
As an emergency nurse only	14.5 (10.5)	20.0 (10.1)
In current ED	8.5 (8.2)	8.6 (7.5)
In all areas of emergency care, excluding nursing (e.g., tech)	7.8 (10.9)	14.5 (14.0)

SD, standard deviation.

Results

QUANTITATIVE ANALYSES SUMMARY

The final survey sample comprised 1,424 registered nurses (response rate of 4.6%) working in general emergency departments (86.0%) located in community hospitals (39.0%) in urban areas (41.1%). Slightly more than one quarter (26.2%) of respondents had cared for patients with firearm injuries during the previous 7 days. The survey data provide partial answers to our research questions, as follows:

Q1: What level of risk for firearms injury do emergency nurses assign to various patient groups?

Analyses of the FTTR and ARPAL constructs provide a more robust, composite measure of emergency nurses' assignment of risk for firearms injury (see Online Supplement, available at www.jenonline.org). However, Table 1 and Table 2 provide basic information about the percentages of respondents who completed each of the 4 firearms safety tasks for various patient populations. Respondents were more likely to screen patients for potential risk of firearm injury when patients had histories of suicide, substance abuse, violent behavior, IPV, and behavioral health (BH) diagnoses compared with patients who had histories that involved firearm injuries or gang violence. Depending on the population group, nurses report *not screening at all* from 21.8% to 43.5% of the time, and thus it is likely that they ascribe a low level of risk to some patient groups.

Q2: How do emergency nurses assess for access to firearms in various patient groups?

Table 2 reports the frequency with which emergency nurses reported assessing for the presence of firearms in the home. A patient presenting with a current or past history of IPV was most likely to prompt this assessment, with 19.9% of participants responding they would ask about in-home access, followed by a patient with a current or past history of violent behavior (17%). Table 2 also describes respondents' assessment of patients by age group; in less than 6% of cases would the nurse find the age group of the patient a risk factor that prompted them to further assess the presence of firearms in the home.

Q3: Do emergency nurses have different responses to confirmed firearm access depending on the patient group?

Table 2 reports nurses' responses to confirmed in-home access to firearms by patient population. The survey options were to *Counsel to reduce risk* and to *Include risk reduction strategies in discharge instructions.* Results suggest that emergency nurses are extremely unlikely to address safety concerns in a consistent way for any patient group.

Q4: Is there a relationship between nursing demographics and likelihood of asking about the presence of/access to firearms for various patient populations?

TABLE 5
Facility characteristics

	Survey (%) (n = 1,424)	Focus Groups (%) (n = 25)
ED Patient Population		
General ED	86.0%	84.0%
Adult Only	10.5%	8.0%
Pediatric Only	3.5%	8.0%
Facility Type		
Non-Government, Not-for-Profit	72.0%	80.0%
Investor-Owned, For-Profit	15.7%	12.0%
State or Local Government	10.2%	0.0%
Federal Government/ VA/Military	2.1%	8.0%
Geographic Location		
Urban	41.1%	40.0%
Suburban	35.1%	48.0%
Rural	23.8%	12.0%
Geographic Distribution		
Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	19.2%	20.0%
Northeast (CT, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	11.4%	40.0%
Southeast (AL, AR, DC, DE, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	21.4%	20.0%
Southwest (AZ, NM, OK, TX)	21.4%	8.0%
West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)	26.6%	12.0%
Annual ED Patient Visits		
1–5,000	3.1%	4.0%
5,001–10,000	4.5%	0.0%
10,001–20,000	8.4%	4.0%
20,001–30,000	8.3%	12.0%
30,001–40,000	11.6%	20.0%
40,001–50,000	10.5%	12.0%
50,001–75,000	20.8%	28.0%
75,001–100,000	14.2%	12.0%
>100,000	11.2%	4.0%
Missing	7.6%	4.0%

continued

TABLE 5
Continued

Table 3 describes nurses' answers to questions about their own knowledge, attitudes, and beliefs about gun violence and their experience with firearms-safety education. Linear regression modeling (Table 6 and Online Supplement) suggests that nurses who have had some education about firearms safety were more likely to ask patients about in-home access.

QUALITATIVE

The final focus group sample comprised 25 registered nurses working in general emergency departments (84.0%) with 50,000 to 75,000 patient visits per year (28%), located in non-government, not-for-profit hospitals (80.0%) in suburban areas (48%).

Human Element Maps

Human elements that contribute to firearm injury risk-assessment include emergency nurses, their patients, and visitors, some of whom may have a history of firearm violence (e.g., gang members, visitors who bring weapons into emergency departments in states with conceal carry laws). Specifically, this group of nurses reported broaching the subject of firearms almost exclusively to a narrow patient population of suicidal patients with a plan.

> *In the ED I work at, … when that comes up, when that question comes up, and they say they are having suicidal thoughts, we will ask, "Well, do you have a plan? Do you have any access to firearms?" Other than that, it's not something we immediately ask. (Charge Nurse F18)*

> *Routinely we're not looking for gun violence, even though I live in an area that has a high amount. We average a gunshot every couple of weeks, and we're not a trauma center; they just know to come to us, and yet we don't assess for it unless it's a suicidal patient….all behavioral health patients get the same screening but it's not gun-violence specific. (Clinical educator M11)*

TABLE 6
Linear regression modeling by domain

Domain/Type	Predictor Block	0-Order Block Effect			Unique Block Effect			Overall Model		
		DV1 MR^2	DV2 MR^2	DV3 MR^2	DV1 ΔMR^2	DV2 ΔMR^2	DV3 ΔMR^2	DV1 MR^2	DV2 MR^2	DV3 MR^2
1 / N	Preparedness/Plan for Treatment	**17.7*****	**18.1*****	**16.9*****	**8.9*****	**9.0*****	**9.5*****	**35.9*****	**28.5*****	**23.6*****
2 / N	Attitudes/Beliefs About Firearms	**6.3*****	**6.7*****	**3.8*****	**3.3*****	**2.9*****	**2.1*****			
3 / N	Education and Experience	**5.7*****	**6.3*****	**6.0*****	1.0	**1.0***	0.9	% Unique Variance		
4 / N	ED Role	1.1	0.6	0.6	**1.1***	0.3	0.4		DV1:	**26.2%**
5 / N	Demographics	1.0	**1.2****	**0.8***	0.4	0.4	0.4		DV2:	**18.1%**
6 / N	Recent FA Treatment Experience	0.1	**0.8****	0.2	0.0	**0.7****	0.2		DV3:	**15.8%**
7 / S	Patient Age Groups Treated	0.2	0.1	0.1	0.0	0.0	0.1			
8 / S	Region and Population Density	0.2	0.4	0.3	0.5	0.5	0.4	% Common Variance		
9 / S	Type of Institution	1.1	0.4	0.6	1.3	0.8	0.4		DV1:	**9.8%**
10 / S	Treatment Volume	1.3	0.6	0.9	0.9	0.3	**0.9***		DV2:	**10.4%**
11 / S	Firearm Treatment Policies	**12.4*****	**5.4*****	**2.1*****	**8.8*****	**2.1*****	**0.5***		DV3:	**7.8%**
Domain Type	Predictor Block Set	0-Order N or S Effect			Unique N or S Effect					
		DV1 MR^2	DV2 MR^2	DV3 MR^2	DV1 ΔMR^2	DV2 ΔMR^2	DV3 ΔMR^2			
Nurse (N)	Nurse – Domains 1 to 6	**24.1*****	**24.4*****	**21.2*****	**20.8*****	**21.7*****	**19.4*****			
Setting (S)	Setting – Domains 7 to 11	**15.1*****	**6.8*****	**4.2*****	**11.8*****	**4.1*****	**2.4***			

* $P < .05$.
** $P < .01$.
*** $P < .001$.

Participants reported challenges with bringing up the topic of firearms in a way that did not seem to be confrontational; this was a significant factor in whether they were willing to question patients about the accessibility of firearms in their homes.

> *So for our staff in the EDs, we're just plainly afraid to ask, "Do you have a gun or are you carrying a gun?" because lately you just look at somebody wrong, and they shoot you. And the clubs and the restaurants in the street, 2 of my facilities just had fatal shootings in the hospital last week. You know, so we're just to a point where you don't ask, don't know, because we don't want to aggravate them all, or will that question be the trigger for them to pull out a gun and start shooting? (Clinical educator F1)*

Nonhuman elements included "the government" and the perception that asking about in-home access to firearms jeopardizes the patient's Second Amendment rights.

> *I have seen information on the internet and on Facebook that if you're a legal gun owner and your doctor asks you if you own a gun, say "no," immediately because this is the beginning of the left wing trying to take away the second amendment—it's out there and it's big. (Charge Nurse F13)*

> *And so I think what a lot of people are concerned about is if Uncle Sam, you know, if we start answering all these questions truthfully, and all of a sudden Uncle Sam gets some way to, you know, if we go to a national health care system or something like that, this is a thought process (okay), that that question is going to be in my health records, so now they're going to know exactly where to come to get the guns. They're not taking my guns; those are my guns. I don't want the government coming after my guns. So I think that's a lot of, I know a discussion that my circle of people that go and shoot and everything, I know they're like, "You can ask me till you turn blue in the face, I'm not telling you nothing." (SNF24)*

> *I live in California where… if your doctor or your spouse or someone like that can go to a judge and say, "Hey, something's not right," and they can come take your guns for 2 weeks without a hearing or anything like that. You don't have to be there, you don't have to be guilty or anything like that, so there's a sense of paranoia from a lot of gun owners about that. I think that's where it comes from. (Clinical educator M11)*

Social Worlds Maps

Regional and local differences became apparent in focus group participants' understanding of firearms-risk assessment. Some nurses viewed firearm prevention as a public health issue rather than an intrusive, confrontational question. Also, in contrast to survey findings, focus-group participants reported that local attitudes about firearm ownership and the pervasiveness of ownership affected the willingness of the nurse to ask about access to firearms. Data analysis revealed that although local community attitudes were not a significant factor driving nurses to assess for in-home access, nurse beliefs and attitudes were.

> *So up here, in this part of the state, we're not asking, and where I worked in the inner city, it was a common question every day because everybody had a weapon; there was a lot of gang bangers, the whole thing, 5 or 6 shootings a night we were doing. (Manager M7)*

To shift the conversation from a matter of personal rights to one of public health, some nurses suggested that questions about firearms accessibility should become normalized.

> *But if everybody asks the same question, then guess what? Then whether I go to your hospital, your hospital, your hospital, or my hospital, you're asked the same question, and, like anything, it becomes commonplace after a while. (Director M21)*

Positional Maps

As noted above, positional maps note the *area of silence* or the elephant-in-the-room, which is ignored but is nevertheless obviously and painfully present. A key area of silence consistently identified in the focus group data is fear *of* patients rather than fear *for* patients. Our participants repeatedly reported reluctance to ask patients about access to firearms and risk of injury: specifically, because they worried that patients had weapons on their persons or readily available; if the patient became offended by the question, they feared the patient would use that weapon on the ED staff.

> *I had to go and tell a patient, "No, we can't fill your Oxycodone 20 mg because it's from an outside provider and because our VA provider already gave you hydromorphone Q4 hours; the pharmacy is not going to fill both." Had I not been standing in the doorway when I told him that after talking to my provider, I would have gotten slammed with his cane because he threw the cane right where my chair was and threw the chair across the room because he got so upset with me. (SNF24)*

The fear or discomfort of holding on to potentially harmful information relevant to a given patient's safety (eg, risk for IPV or suicide due to lethal means in the

home), having no guidance for action, and concern about potential liability for any harmful consequences was reported by our participants as a barrier to risk assessment. Essentially, if a risk-to-benefit analysis suggested a high personal risk to staff and no perceived benefit to patients, there was significant resistance to asking.

> *It is because you end up knowing – you know you're going to see the person one day come in dead. You know it's going to happen. I can't imagine many of the people in this room haven't seen that happen, or maybe you're luckier than I am. But you have that story, and you're just like, "Well, I told you not to go home." (Charge RN F15)*

> *"Oh my daughter got killed, but the nurse in the hospital knew there were guns at home," and she said she was in danger, why didn't we do anything? What is our responsibility or the legality, you know because HIPAA prohibits us, and we know they tell us that they are being confused, they are afraid, but they are more afraid of not going back; we can't stop them, and, at the end, what is our responsibility? (Charge nurse F1)*

Discussion

The purpose of this study was to explore emergency nurses' perceptions of patient risk for firearm injury and how these perceptions affected the process of ED patient screening, assessment, counseling, and provision of discharge education. Despite the evidence that the presence of an easily accessible firearm (specifically, a handgun) in the home increases the risk of homicide,[24] suicide,[15,25] and injury, and along with the American Medical Association[26] identifying the large number of firearms available for purchase as a public health problem, nearly two thirds (60%) of our survey participants responded that they agree or strongly agree with the statement: "Regardless of the potential for injury, everyone has the right to own a gun."

SCREENING AND ASSESSMENT PRACTICES

To answer our first 2 research questions, we integrated findings from both arms of the study that were related to emergency nurses' perceptions of risk for firearm injury (Q1) and assessment of in-home access to firearms (Q2). A key finding of the survey arm is that only about one third of our sample regularly screen patients for risk of firearm injury, even in what are known to be elevated-risk populations (pediatrics, behavioral health, and IPV presentations). This suggests that emergency nurses' perceptions of risk are limited to a very narrow group of patients and also might be affected by personal beliefs regarding gun ownership. Our focus-group participants, providing further explanation of this phenomenon, discussed several common concerns: the fear that patients will become angry at questioning and use firearms on ED staff and the discomfort of holding information relevant to patient safety but having no guidance for action. Both survey and focus-group participants viewed the local political, social, and legal environment around firearm ownership as an influence on patients' views of questioning as a deeply intrusive act, one that presents a significant barrier to emergency nurses' assessment of risk for firearms injury. Several focus-group participants mentioned their rural communities, where patients (and their ownership of firearms) were known to them as barriers to intrusive questioning.

Although screening activities were reportedly infrequent among survey respondents, both focus- group and survey participants described different responses according to levels of perceived risk in various patient groups. In their daily practice, focus-group members reported that firearms screening was most commonly done with patients who had an identified or suspected risk for suicide or among their patients who had a known risk of IPV. This is consistent with extant literature as well as our survey results in which 56.1% of respondents reported asking patients with BH complaints about access to in-home firearms, and 42.7% reported asking patients with histories or complaints of IPV about in-home access.

NURSE RESPONSE

To answer our third and fourth research questions, we integrated findings from both arms of the study that were related to emergency nurses' responses when a risk was identified (Q3) and the demographic factors that potentially influenced their actions (Q4; e.g., knowledge, attitudes/beliefs, preparedness). Linear regression modeling analyses of survey data identified the significant factors that increase the likelihood of emergency nurses conducting firearms safety tasks as (1) having received firearm prevention and safety education and feeling prepared to manage both the inquiry and follow-up actions and (2) having colleagues available to further assess the patient's risk. Among focus-group participants, availability of resources and education were also mentioned as potential facilitators to overcome barriers and improve screening. There was some agreement that using a public health approach to firearm safety might lead to greater patient acceptability.

Both survey and focus-group results indicate that nurses' responses to confirmed firearm access appeared to be less dependent on the patient group than on nurses' personal experiences and preparedness. It is possible that part of the "risk" assessment is based on the nurse's calculation of personal risk rather than the risk to the patient. This proposition is supported through triangulation with survey results suggesting that nurses who feel prepared (e.g., received training) perceived asking about firearms as a lower-risk/higher-reward situation compared with nurses' who feel less prepared. With the rising occurrence of violent incidents and active shooters in the ED workplace, the fear of violence from patients is a valid and pervasive one for emergency nurses. Research suggests that from 50% to 82% of emergency nurses reported being physically assaulted at work during the preceding year,[27,28] with the incidence of verbal abuse approaching 100% of emergency nurses in some facilities.[29] The addition of firearms into this already-fraught environment makes it very difficult for nurses to assess patient risk, or their own, especially when there is a lack of resources and preparation to address a high-risk situation with little or no perceived reward. When nurses fear their patients, the therapeutic relationship that is the core of nursing practice cannot be formed, and thus critical information about patient risk may not be accessed and communicated.

Limitations

Participants in both arms of this study were a self-selected group in a purposive convenience sample of emergency nurses. The response rate to the survey was 4%, and we were not able to determine if this low response rate was due to hospital/facility IT security, such as firewalls or e-mail filtering, which prevented survey participants from receiving the emailed survey, or if some other reason was involved. We were also not able to ascertain if nurses not opening the survey link were demographically different from nurses who completed the survey. Although the sample for both the survey and focus groups was demographically representative, responses and conclusions cannot necessarily be extrapolated to the general emergency nursing population. Finally, although all participants were currently practicing in the emergency department, not all participants in the survey or the focus groups provide direct care to emergency patients (Charge Nurse, Clinical Coordinator, Clinical/Nurse Educator, Clinical Nurse Specialist, Director, Manager, Trauma Coordinator). Although their perspectives include indirect patient care experience (while supervising direct caregivers) and past experiences of patient care, their lack of direct involvement in recent emergency patient-care experiences is a study limitation.

Conclusions and Implications for Emergency Nurses

The assessment of risk is a critical function of emergency nursing. Standardized assessment of access to in-home firearms during the ED visit may identify patients in need of further intervention. Both education and training in firearms safety, as well as the presence of trained nursing staff on each shift who can further assess patient risk and offer intervention in the form of resources or information, may increase nurses' willingness to pursue this line of inquiry. Implications for emergency nursing practice from this study are as follows: (1) Emergency departments need to educate emergency nurses on the importance of assessing for firearms in the home and provide emergency nurses with assessment techniques to obtain this type of information in a nonjudgmental, nonconfrontational manner; (2) emergency departments need to educate emergency nurses on resources that are available for health care providers, patients, and families that will help to ensure that adequate safety measures are available when firearms are accessible in the home; and (3) emergency departments need to address concerns about violence in the emergency setting to improve patient assessment and improve workplace safety to maximize positive patient outcomes.

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Online Supplement

DATA

Predictors were derived from scales based on factor analyses of embedded question sets and from numerous stand-alone items in the firearms survey. After 2 embedded question sets were reduced to scales via separate factor analyses, the range of stand-alone items and scales were organized into 11 domains of inquiry, based on investigator judgment concerning domain content. The predictor set covered 62 degrees of freedom split among 11 domains of inquiry. These 11 blocks were further collapsed into sets of blocks measuring either Nurse or Setting characteristics.

SCALE CONSTRUCTION DETAIL

Overall, 8 scales were constructed: 2 were dependent variables in the standard multiple regression models that follow; the others were included in relevant predictor domains along with other single-item predictors.

SCALE CHARACTERISTICS

The Firearm Treatment Task Rating (FTTR, alpha = 0.77) is an average of 5 question set items assessing the frequency of screening, assessment, counseling, risk-reduction procedures, and provision of educational materials. Items are rated on a 3-point frequency metric (never, half the time, most of the time). The scale is an item average x 30 (range 10 to 30) and was 1 of the 3 dependent variables (DV2).

The At-Risk Population Action Level (ARPAL, alpha = 0.91) is an average response level for 6 "At Risk" patient populations (e.g., history of intimate partner violence, suicidality) indicating the highest level of safety tasks that are part of regular care for more than 50% of each population (levels range from 0 to 4, referring to none, screening, assessment, counseling, and risk reduction, respectively). The scale is an item average x 10 (range 0 to 40) and was 1 of 3 dependent variables (DV3).

The Conditional Treatment Task Count (CTT, alpha = 0.61) is the number of 5 items endorsed that indicate actions that would be taken after a patient/family member informs the nurse that there are firearms in the home. This scale was included in Domain 1: Nurse Preparedness/Plan for Treatment.

A principal components factor analysis (PCA) of a set of attitude items rated on the same 5-point metric (strongly agree, agree, neutral, disagree, strongly disagree) was conducted. All resulting scales had a theoretical range from 0 to 40, with 20 being neutral. Based on interpretability and relatively simple structure of the rotated 3-factor solution (54% variance explained), 3 scales were constructed. The Firearm Safety Clinical Skill Score (FSCS, alpha = 0.51) is an average of 4 items, with 1 item reverse-coded. Higher scores indicating agreement with statements affirming perceived firearm safety clinical intervention skill. Attitude Toward Guns Scale (ATG, alpha = 0.75) is an average of 4 items with 2 items being reverse-coded, and higher scores indicating agreement with statements indicating a positive/favorable attitude toward gun ownership. The FSIN Firearm Safety Intervention Need Scale (FSIN, alpha = 0.49) is an average of 2 items, with higher scores indicating agreement with statements indicating acknowledgment of a societal need for firearm safety interventions. The FSCS scale was included in Domain 1, and the ATG and FSIN measures were included in Domain 2: Nurse Attitudes/Beliefs About Firearms/Gun Ownership.

Another PCA was applied to a questionnaire set of 10 items assessing influences on the nurse's decision to inquire about firearm safety and resulted in 2 behavioral influence scales. The 2-factor solution accounted for 62% of item variance, and scale item sets were based on the rotated 2-factor solution. Items were all rated on a 3-point metric (1 to 3), indicating the extent of perceived influence (not at all significant, somewhat significant, highly significant). Scales range from 0 to 30 (item average x 10). For the Behavior Influence–Societal Attitude scale (ATT, alpha = 0.82), higher scores indicate greater influence of societal attitudes. For the Behavior Influence–Policy/Law/Events scale (PLE, alpha = 0.82), higher scores indicate greater influence of institutional policies, laws, and events. The ATT and PLE scales were included in Domain 2.

Regression models entailed multiple logistic (DV1) regression or multiple linear (DV2, DV3) regression were contrasted, with effect sizes described via Nagelkerke multiple R2 or conventional OLS multiple R2, respectively. DV2 and DV3 were subjected to monotonic normalizing transformations (log-linear) to meet normal distribution assumptions. For each of the 11 blocks of predictors determined (*a priori*) to fall within 11 assessed domains, simple zero-order effects (multiple R2 for the whole block/domain) and unique effects (incremental change in multiple R2, after controlling for other blocks) were estimated. In addition, corresponding estimates were obtained for the set of all Nurse blocks and the set of all Setting blocks.

Multiple logistic and linear regression analyses were conducted predicting 3 dependent variables (DV). Table 3 summarizes the % error reduction associated with zero-order, unique, and full model tests for all 3 dependent variables.

The most basic indicator of the extent of nurse inquiry in firearm risk is DV1: 33.8% of respondents affirmed having asked patients about firearms in the home. The full model accounted for 35.9%, 28.5%, and 23.6% of score variation for DV1, DV2, and DV3, respectively. For all variables, nurse characteristics (Domains 1 to 6) accounted for substantially more error variation than setting characteristics (Domains 7 to 11). For the set of Nurse domains, error reduction was similar across dependent variables, and in the set of Setting domains, error reduction was more substantial for the general inquiry item (DV1) than for the FTTR and ARPAL scales (DV2, DV3).

A more detailed examination of the Setting effect shows that only 1 domain (Firearm Treatment Policies) yielded consistent significant effects across the 3 dependent variables and accounted for 12.4% of general inquiry (DV1) zero-order error and 8.8% of unique error variance controlling for all other 10 domains. The relative importance of this setting domain for DV1 (versus other outcomes) may be because the relationship between policy and the more general range of treatment tasks or population foci (DV2, DV3) may be expected to depend to some extent on DV1.

The relatively larger Nurse effect included significant components in several Nurse domains. By far, the single domain having the greatest impact was the nurse's sense of being prepared and having a plan for dealing with the consequences of firearms inquiry (Block 1). Across the 3 firearms inquiry/treatment outcomes, this item domain accounted for consistently large zero-order and unique effects. Attitudes and beliefs about firearms also showed consistent and significant zero-order and unique effects. Education and Experience showed significant zero-order effects; however, unique effects for this domain were marginal and usually not significant. Other Nurse domains showed marginal and usually nonsignificant or inconsistent zero-order and higher-order effects.