Mild Traumatic Brain Injury: A Survey of Perceived Knowledge and Learning Preferences of Military and Civilian Nurses

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ABSTRACT

Early case recognition and intervention by nurses for patients with mild traumatic brain injury (mTBI) can significantly improve outcomes for civilian and military patients. The ''Concussion/mTBI Learning Needs Assessment for Registered Nurses Survey'' was developed to evaluate bedside nurses' knowledge related to the assessment and care of patients with mTBI as well as their preferences for learning in order to develop a targeted curriculum. An anonymous, self-administered, Web-based survey was available from February to August 2009. A series of invitational e-mails were sent to nurses at a convenience sample of civilian, federal, and military institutions. A total of 1,224 nurses meeting the inclusion criteria of being bedside care providers and nonadvanced practice responded and were included in the analysis (civilian, n = 731; military, n = 494). Most respondents (91.3%) considered knowledge of mTBI to be important or very important to their practice, and 44.5% saw mTBI patients at least monthly. Despite this perception of importance and exposure to the patients, nurses' self-reported knowledge levels were very low. Overall, 39.8% expressed a high knowledge level (score of 4 [a lot] or 5 [expert] on a 1–5 scale) of the causes of mTBI. Fewer than 25% expressed high knowledge level in the skills needed for the identification and assessment of mTBI patients, and less than 15% had high knowledge in the treatment and prognosis of these patients. The nurses' preferred learning method was shadowing another provider (37%), but the most often used method was Internet searches (80.3%). There was minimal difference between military and civilian nurses. Although nurses recognize the importance of familiarity with mTBI for their practice and most clearly self-identify knowledge deficits in all aspects of care of the mTBI patients, a broad but succinct curriculum for the nonadvanced practice bedside nurse could provide a cost-effective, quickly accessible way to provide the needed education.

Background and Significance
Introduction

Mild traumatic brain injury (mTBI), also known as concussion or closed head injury, is a significant public health problem with clinical relevance for nurses who have professional responsibilities within civilian and military communities. An estimated 1.4 million Americans sustain a traumatic brain injury (TBI) each year, leading to about 1.1 million emergency department visits, 235,000 hospitalizations, and 50,000 deaths annually (Langlois, Rutland-Brown, & Thomas, 2006). About 70% to 90% of all head injuries or

TBIs are classified as "mild," with a small subset of these (between 10% and 20%) experiencing long-term problems that interfere with an individual's ability to function (Cassidy et al., 2004; Kushner, 1998; Ruff, 2005).

Prior to the American Congress of Rehabilitation Medicine statement regarding diagnostic criteria for mTBI, the clinical belief was that a witnessed loss of consciousness (LOC) was necessary for brain trauma to occur. Current accepted protocol to confirm a concussion/mTBI occurrence requires that two conditions must be met: (a) a head injury resulting from physical blow, pressure wave, or rapid acceleration or deceleration and (b) a witnessed or self-reported LOC and/or alteration of consciousness or neurologic event attributable to the injury (Centers for Disease Control and Prevention [CDC], 2004; Gardetto, Gibbons, LaZarre-Miller, & Watts, 2009 Kay et al., 1993). In the event that a person experiences an insult to the head or exposure to a blast or pressure/wave of significant magnitude, diagnosis of concussion/mTBI is made with any loss of consciousness (up to 30 minutes), loss of memory or posttraumatic amnesia (up to 24 hours), Glasgow Coma Scale (13 or above), altered mental state, or focal neurologic deficit (Kay et al., 1993).

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Physical, cognitive, or behavioral symptoms related to a concussion/mTBI may or may not be acknowledged by patients until they try to return to normal function. Because of this delay in recognition, concussion/mTBI outcomes are negatively impacted and the financial and personal costs are great. The national cost of concussion/mTBI is nearly $17 billion each year, and evidence suggests that valuable medical expenses could be saved with proper care of both civilians and U.S. military members in the period immediately after concussion/mTBI (CDC, 2004; Guskiewicz et al., 2003; Guskiewicz, Weaver, Padua, & Garrett, 2000; Hoge et al., 2008). The devastating personal cost of concussion/mTBI experienced by patients and their families is associated with cognitive, physical, psychological, and social problems, which can result in decreased quality of life, unemployment, and long-term disability (Carroll et al., 2004; Langlois, Rutland-Brown, & Wald, 2006).

Nurses can be instrumental in improving outcomes for concussion/mTBI through awareness and application of primary and secondary prevention strategies. Primary prevention for concussion/mTBI includes identifying those at risk, educating them and their families, and advising protective equipment (i.e., helmet) use where necessary. Leading causes of mTBI include falls, seen most commonly in children under the age of 10 years and in older adults over the age of 65 years (CDC, 2004). Next, in order of frequency, are motor vehicle and bicycle injuries, with a peak occurrence in persons 16–35 years of age (Peloso, von Holst, & Borg, 2004). Recognized risk factors for mTBI include alcohol or other substance abuse, previous head injury, socioeconomic status, living conditions, history of preinjury psychiatric diagnosis, marital discord, and learning disability (CDC, 2004; Moore, Terryberry-Spohr, & Hope, 2006).

Secondary prevention includes early identification during the acute (injury to 7 days) and subacute (greater than 7 days to 3 months) periods through the use of accepted screening instruments, educating patients and their families, and making follow-up and referral recommendations so that confirmed concussion/mTBI-related problems resolve while in the care of experienced health professionals. Screening instruments like the civilian HELPS tool (Hit in the head, Emergency room treatment, Loss of consciousness, Problems with concentration and memory, Sickness or other physical problems following injury) or the military's Brief Traumatic Brain Injury Screen assist with identifying individuals who might benefit from early clinical intervention and treatment (Picard, Scarisbrick, & Paluck, 1991; Schwab et al., 2007). Strong evidence exists in support of early educational information in the form of expectation management

> Nurses, both civilian and those in the military, are often the frontline providers of care for most patients; as a result, they must be able to competently assess, treat, and educate patients with mTBI. A perceived lack of these skills may present a significant obstacle to achieving optimal outcomes.

as a means for reducing long-term mTBI symptoms, and for this reason, the CDC recommends monitoring symptoms and intervening in the early stages to ensure the best possible concussion/mTBI outcome (Borg et al., 2004; CDC, 2004; Comper, Bisschop, Carnide, & Tricco, 2005).

Purpose

Obstacles to early case recognition in the civilian community include not recognizing the injury, not seeking appropriate medical care at the time of injury, not recognizing immediate relevant symptoms at the time of injury, and lack of consistent care or follow-up to ensure resolution of concussion/mTBI-related problems (Cassidy et al., 2004; Langlois et al., 2006; Moore et al., 2006). About 25% of those who have experienced concussion/mTBI do not seek medical care at the time of injury and are first seen in an ambulatory care setting (Moore et al., 2006). Sometimes, they seek care long after the traumatic event, making it difficult to recognize concussion/mTBI unless the nurse is alert and knowledgeable about the etiology, symptoms, and sequela of concussion/mTBI.

Similar obstacles to early case recognition exist in the military setting, wherein Operation Enduring Freedom and Operation Iraqi Freedom have led to a significant increase in concussions/mTBIs seen in service men and women. Reports from army medical officials concerning concussion/mTBI have been as high as 18% (Army Times, 2007). In those serving in military and combat operations, concussion/mTBI may be missed if other, more obvious injuries receive immediate attention (The Management of Concussion/mTBI Working Group, 2009). Troops are at risk for sustaining numerous concussions/mTBIs in a short time frame because of numerous deployments and the modern warfare use of improvised explosive devices. High incidences of concussion/mTBI in this

population have made TBI the "signature injury" of the current wars (Helmick, Parkinson, Chandler, & Warden, 2007).

Although concussion/mTBI information and resources are widely available, knowledge gaps and clinical practice inconsistencies exist (Bazarian, McClung, Cheng, Flesher, & Schneider, 2005; Blostein & Jones, 2003; Kennedy, Lumpkin, & Grissom, 2006). To ensure positive outcomes and to avoid long-term problems, care of concussion/mTBI patients involves interfacing with nurses in a variety of care settings, many of whom are not familiar with screening, assessment, and referral of concussion/mTBI. Inability to recognize concussion/mTBI results in delayed treatment, education, and support services crucial for patients and their families. A survey of perceived knowledge in a broad cross-section of nurses is therefore necessary so that a concussion/mTBI curriculum can be designed to provide these nurses with information they can apply in their clinical practice and share with other health professionals.

The "Concussion/mTBI Learning Needs Assessment for Registered Nurses Survey" described in this article was developed to establish what nurses perceive they know about the identification and care of concussion/mTBI patients. Survey responses will be used to construct a broad curriculum for teaching nurses how to screen and refer patients with concussion/mTBI. With it being called the "signature injury" of the current conflicts, there had been a great deal of emphasis placed on its knowledge for military nurses, which may make their responses quantitatively different from civilian nurses. To assess for this, separate analysis by status (civilian vs. active duty military) and overall will be done for all variables of interest.

Methods
Design

This study employed a descriptive design using a Web-based survey to determine as follows:

- Which aspects of mTBI do nurses perceive they have the most and least knowledge about, and are there differences in these perceptions between civilian and active duty military nurse respondents?
- What are the learning preferences of bedside nurses, and are there differences in these preferences between civilian and active duty military nurse respondents?

Stetler's research utilization framework guided this assessment of nurses' concussion/mTBI educational needs, the results of which will be used to develop an mTBI curriculum. Stetler's model depicts how nurses assess new knowledge (evidence as products) and assimilate it into their practice. The model involves assessments of organizational needs (i.e., available resources and situational needs) and individual needs (i.e., values, beliefs, and utilization behaviors) to establish the preferred nature and content of a curriculum for the target audience (Stetler, 1994, 2001). In addition, it recognizes that the individual's knowledge, attitudes, and style of adoption (learning preferences) play a crucial role in his or her knowledge adoption and changing practice. The needs assessment and design of this educational program were undertaken because of a specific congressional request. Earmarked funding for this study was supplied as a grant from the Office of Naval Research. Constituents from a rural congressional district in the United States were the catalyst to create a current and accessible concussion/mTBI education for nurses seeing returning troops and veterans of the current wars. The investigators believe that by promoting nurses' knowledge concerning evidence-based guidelines, best practices, and other relevant concussion/mTBI research findings, the novice nurse can potentially be transformed into an expert in the field of concussion/mTBI screening and referral.

Prior to launching it in SurveyMonkey, the survey was reviewed for content validity by nurses with expertise in concussion/mTBI, and it was validated for congruence with educational objectives by curriculum experts. Once online, e-mails were sent to a convenience sample of military and civilian nursing leaders who are colleagues of the investigators at a number of civilian, federal, and military facilities. The initial e-mail contained a description of the survey and a request to forward the attached e-mail invitation to nurses at their institution. In addition, snowball sampling was encouraged by inviting initial e-mail recipients to pass the survey on to any other colleagues they felt appropriate. The invitation e-mail provided potential respondents with a brief description of the study and a Web link that brought them directly to the survey should they choose to participate.

Sample

The planned sample for this study was a convenience sample, consisting of civilian and military nurses working in nonadvanced practice roles who had the potential to see patients with concussion/mTBI in their practice. Nurses were eligible to participate in this survey if they were over the age of 18 years, had direct patient care as their primary job responsibility, and were not advanced practice nurses (i.e., nurse practitioner, certified registered nurse anesthetist, certified registered nurse midwife, etc.). Nurses in primarily administrative roles were asked to exclude themselves from the survey.

Institutional review board approval from the investigators' institution was received prior to study

recruitment. Study consent was presented to participants when they first linked to the survey. The study was voluntary and anonymous, listing research subject's rights, e-mail addresses and telephone numbers of the investigators, and institutional review board contact information on the opening "consent" page.

Procedures

The data points that were collected include demographic variables describing the survey respondent, their workplace, the types of patients they saw, and their educational level. The next section asked them to rank preferred learning methods and then mark all learning methods they used in their practice. This was followed by 17 specific topic statements to which the nurses responded by indicating their relative knowledge in that particular area on a scale of 1–5, with knowledge rankings of 1 (*none*), 2 (*some*), 3 (*moderate*), 4 (*a lot*), and 5 (*expert*). Finally, a section for open-ended responses, where the nurse could add any additional information, was provided.

Data were collected automatically by the Web survey server as respondents filled in. Data were saved in an anonymous database that did not include media access control addresses or IP addresses and downloaded automatically to the principle investigator's university-supplied, password-protected computer. An initial check of the data was done after the first 25 responses to ensure that the survey was clear and that everything was functioning properly. Interim analysis was performed after the first 100 respondents and when the initial minimum sample estimate of 180 was reached. After the first month, a second round of e-mails was sent. At the end of the second month, an additional round of e-mails was sent to the secondary group of nurse leaders, and a tertiary cadre was identified and solicited. At no time did nurse leaders receive more than two solicitations for study participation. Data collection ceased on the date listed in the solicitation e-mails because data collection needed to be complete to produce the mTBI curriculum according to the investigator's grant timeline.

Results
Sample

Between February 1 and August 31, 2009, 2,326 nurses responded to the survey. Of these, 1,102 nurses did not meet inclusion criteria because they either did not provide direct patient care ($n = 336$), were advanced practice nurses ($n = 312$), or were in primarily administrative roles ($n = 454$), leaving 1,224 respondents who met eligibility criteria and returned useable surveys, which were analyzed for this study. The sample had slightly more civilians ($n = 731$, 59.7%) than active duty military members

($n = 493$, 40.3%). Overall, 45.4% of the sample was under the age of 40 years, with a lower proportion of civilian nurses under the age of 40 years (31.3%) compared with the military nurses (64.9%; $p > .05$). In concurrence with their age, the respondents also had a significant amount of experience, with a mean of 5.2 years in their current position and a mean of 12.2 years of experience in nursing overall. Civilian nurses had more experience than did their military counterparts, both in their current position (7.0 vs. 2.7 years; $p < .001$) and overall in nursing (14.7 vs. 8.4 years; $p < .001$).

Work settings were comparable regardless of employer, with inpatient care being the work setting for 46.7% of the respondents. Likewise, the ages of patients seen were similar between the groups, with most seeing patients aged 19–39 years (88.5%) and 40–59 years (85.2%). However, civilian nurses saw patients at the extremes of age (over age 60 years and under age 13 years) significantly more often than military nurses did ($p = .003$), whereas military nurses more commonly saw patients in their young adult years (ages 19–39 years; $p < .001$). Complete results appear in Table 1. The mTBI patient was a consistent and significant practice component for most of the nurses, with, interestingly, no significant difference between military and civilian practitioners. Overall, 44.5% saw mTBI patients in their work setting, and 91.3% perceived knowledge of mTBI as important or very important to their current practice, although military nurses were slightly more likely to have attended an educational session on mTBI at least once (57.8% vs. 64.2%; $p = .027$; Table 1).

Learning Methods

Overall, most nurses chose shadowing another provider as their preferred learning method (39.8%), followed by reading/text-based learning (16.9%) and lecture and classroom learning (15.2%). Although both civilian and military nurses ranked Web-based learning as the least often preferred method (5.1%), civilian nurses preferred it significantly more often than military nurses did (6.7% vs. 2.8%; $p = .002$; Table 2). Despite their stated lack of preference for Web learning, the reality was that Internet searches were the most commonly used learning method for both civilian (80.3%) and military (84.2%) nurses ($p > .05$), followed by asking a colleague, which was marginally less common for civilian nurses (73.6% vs. 78.7%; $p = .041$), and reading an article (51.0% vs. 45.8%; $p > .05$). Civilian nurses also consulted textbooks frequently, although less often than military nurses did (59.8% vs. 66.7%; $p = .014$), but attended more face-to-face sessions (45.6% vs. 31.2%; $p < .001$) and conferences (37.3% vs. 22.5%; $p < .001$). Internet

TABLE 1. Personal and Professional Description by Civilian and Active Duty Nurses

	Civilian Nurses (*n* = 731)	Active Duty Military Nurses (*n* = 493)	Overall (*N* = 1,224)
Demographics			
Age < 40 years (%)	31.3	64.9	45.4
Education, with BSN (%)*	65.6	98.8	78.9
Years of nursing experience, mean*	14.7	8.4	12.2
Years in current position, mean*	7.0	2.7	5.2
Current work setting (%)			
Primary care	3.7	5.9	4.6
Emergency department	12.5	8.4	10.9
Ambulatory care/MD office	2.8	3.3	3.0
Inpatient	44.3	50.3	46.7
Other	36.7	32.1	34.9
Ages of patients seen (% in each age group)			
0–1 years*	26.5	37.9	31.1
2–5 years*	29.1	37.1	32.4
6–12 years*	31.7	38.7	34.6
13–18 years	44.2	47.5	45.5
19–39 years*	85.6	92.7	88.5
40–59 years	86.7	83.0	85.2
60 years and above*	85.5	74.6	81.1
mTBI experience			
Sees mTBI patients *at least* once a month (% yes)	46.4	42.0	44.5
Ever attended at least one mTBI educational session (% yes)*	57.8	64.2	60.4
Perceived importance of mTBI knowledge to current practice (% important or very important)	90.5	92.5	91.3

Note. BSN = bachelor of science in nursing; MD = medical doctor; mTBI = mild traumatic brain injury.
*Statistically significant difference (*p* < .05) between active duty and civilian nurses (all other comparisons are not significant, with *p* > .05).

continuing education units were the least common method used, with only 25.7% of civilian nurses and 21.1% of military nurses employing this learning route (*p* = .002). Complete results appear in Table 2.

Perceived Knowledge
Knowledge levels of specific mTBI topic areas were assessed on a Likert-type scale, with nurses assigning a self-report ranking of their perceived knowledge as 1 (*none*), 2 (*some*), 3 (*moderate*), 4 (*a lot*), or 5 (*expert*). Data were grouped into those with high knowledge levels (ranking of 4 or 5) and those with moderate to no knowledge (ranking of 1, 2, or 3). Although no knowledge area had most nurses reporting high knowledge, nurses were most comfortable with the anatomic and patient examination aspects of mTBI, with reported "high" knowledge levels greatest for types of events (40.7%), interviewing

techniques (23.1%), physical examination (19.8%), posttraumatic stress disorder as it related to mTBI (18.0%), and pathology of mTBI (16.0%). They were least comfortable with the treatment and education aspects of mTBI, with reported high knowledge levels least common for treatment or therapy (10.3%), mTBI care plans (10.2%), patient education needs (9.9%), family education needs (9.8%), and stages of recovery (7.7%). Military and civilian nurses were similar in both ranking and knowledge on most areas, with civilian nurses expressing slightly higher levels of knowledge on interviewing (25.4% vs. 19.7%; *p* = .023) and physical examination (22.8% vs. 15.4%; *p* = .002). Complete results appear in Table 3.

Discussion
Approximately 1.4 million Americans experience TBI annually (Langlois et al., 2006); of these, between

TABLE 2.	Learning Method Preferences and Learning Methods Used by Civilian Nurses and Active Duty Nurses		
Learning Methods	**Civilian Nurses** (*n* = 731)	**Active Duty Military Nurses** (*n* = 493)	**Overall** (*N* = 1,224)
Learning methods (% indicating this is their preferred method)			
Shadowing another provider	37.0	43.9	39.8
Reading/text based	18.0	15.3	16.9
Lecture/classroom	15.7	14.5	15.2
Simulation with standardized patients	10.6	11.6	11.0
Case studies with moderator-led discussion	9.6	6.4	8.2
Computer-based learning using CD/DVD	5.8	4.7	5.3
Web based (Internet) with interactive content*	6.7	2.8	5.1
Usual learning methods (% using this method)			
Perform an Internet search	80.3	84.2	81.9
Ask colleague*	73.6	78.7	75.7
Consult a textbook*	59.8	66.7	62.6
Read an article	51.0	45.8	48.9
Attend a face-to-face class*	45.6	31.2	39.8
Attend a conference*	37.3	22.5	31.4
Complete an Internet CEU*	28.9	21.1	25.7

*Statistically significant difference (*p* < .05) between active duty and civilian nurses (all other comparisons are not significant, with *p* > .05).

70% and 90% are classified as "mild" or mTBI (Cassidy et al., 2004). Although most patients recover with no sequela, a small but significant number (10%–20%) experience long-term symptoms that interfere with their activities of daily life (Kushner, 1998; Ruff, 2005). Early detection of the potential for mTBI by nurses caring for these patients can significantly improve outcomes because strong evidence exists that earlier intervention can lessen long-term symptomatology. In particular, early educational interventions in diagnosed cases such as expectation management have been shown to be effective in reducing long-term mTBI symptoms. (Borg et al., 2004; Comper et al., 2005). Even the CDC (2004) recommends timely assessment and intervention to ensure the best possible outcomes for patients with mTBI.

Because nurses are the frontline providers of care for most patients, knowledge of the assessment, treatment, and education of mTBI patients should be a fundamental skill of both neurological and nonneurological specialty nurses for promoting optimum patient outcomes. In fact, in this study, most respondents (91.3%) considered knowledge of mTBI to be important or very important to their practice, and nearly half of the nurses surveyed saw mTBI patients on a regular basis. Despite this perception of importance and exposure to the patients, nurses' self-reported knowledge levels were very low. Although the largest proportion knew what caused mTBI, fewer

than 25% expressed high levels of knowledge in the skills needed for the identification and assessment of mTBI patients, and less than 15% were fluent in the treatment and prognosis of these patients. Even more worrisome, less than 10% expressed high knowledge levels in their ability to provide education to mTBI patients and/or their families, one of the most critical of nursing interventions.

The nurses in this survey clearly recognized the importance of knowledge of mTBI and their own deficits in this area. The question becomes how to best provide them with the knowledge they clearly desire and need. Most nurses chose shadowing another provider as their preferred learning method; one-on-one training is probably the most expensive and least consistent way to impart information to large numbers of people. In addition, it is a modality that is better suited for passing on skill-based as opposed to didactic knowledge.

Unfortunately, computer or Web-based learning, which is an inexpensive and consistent method for passing on didactic knowledge, was also the least preferred. It must be noted, though, that despite the nurses' stated lack of preference for Web learning, the reality was that the Internet was the most common source of knowledge for both civilian and military nurses. This likely reflects the reality of self-learning and continuing education: The need for knowledge is often immediate, and Web-based education, although not preferred, provides the immediacy of availability

TABLE 3. Percentage of Respondents Rating Their Perceived Knowledge of the Specific mTBI Topic Area as ''A Lot'' or ''Expert''

Specific mTBI Topic Area	Civilian Nurses (*n* = 731)	Active Duty Military Nurses (*n* = 493)	Overall (*N* = 1,224)
Types of traumatic events likely to cause mTBI	40.3	41.2	40.7
Interview technique including relevant history, symptoms, and psychosocial issues that reveal mTBI*	25.4	19.7	23.1
Physical examinations specific to mTBI*	22.8	15.4	19.8
Posttraumatic stress disorder as it relates to mTBI	17.1	19.5	18.0
Pathology/anatomical changes to the brain with mTBI	16.7	14.9	16.0
Imaging studies appropriate for mTBI	16.5	12.6	14.9
Comorbidities common with mTBI	15.5	13.2	14.6
Physiology/alteration in brain function with mTBI	15.2	13.8	14.7
Current screening tools for identifying mTBI	14.6	12.1	13.6
Postconcussive syndrome as it relates to mTBI	14.0	10.4	12.6
Long-term prognosis and outcomes for patients with mTBI	10.4	10.6	10.5
mTBI guidelines	10.6	9.8	10.3
Treatment and therapy options for mTBI	11.2	8.9	10.3
mTBI care plans	10.0	10.4	10.2
mTBI patient education needs and resources	9.7	10.2	9.9
mTBI family education needs and resources	9.7	10.0	9.8
Stages of recovery from mTBI	7.8	7.6	7.7

Note. mTBI = mild traumatic brain injury.
*Statistically significant difference (*p* < .05) between active duty and civilian nurses (all other comparisons are not significant, with *p* > .05).

and ease of access, which is often more important. Even the number 2 preference of reading/text-based learning is a modality that often requires a moderate amount of time and effort in making a trip to a library, bookstore, or other central repository.

Optimally then, a resource that is immediately available and easily accessed would provide an mTBI learning opportunity that is both quick and convenient. In a more circumscribed setting, providing a means for one-on-one learning should be strongly considered to make the learning situation as flexible and open as possible. Unfortunately, in this situation, where the requirement was to provide education to large numbers of nurses as efficiently as possible, the provision of one-on-one instruction was not the primary goal. However, every effort can be made to structure a curriculum so that it could be approached in several ways. A properly configured computer or Web-based resource could provide the nurse with both printable (static) reading and interactive content as the preferences of the learner dictates. In addition, it could be used as the basis for one-on-one learning situation, if desired. This type of resource could be continuously available and could be used as an on-the-spot resource or as a more in-depth continuing education offering.

Limitations

This survey involved a convenience sample and, as such, may or may not be representative of nurses in general. In addition, it had a much larger percentage of nurses with military affiliation (active duty or military reservists) than is present in the general population, and again, this overrepresentation may not be representative of the larger pool of registered nurses in general. Finally, the survey asked the nurses to self-report their perceived knowledge as opposed to measuring actual knowledge. A reliable and valid test of mTBI knowledge may have shown that the nurses are overestimating or underestimating their true knowledge.

Conclusions/Recommendations (Summary)

It is clear that nurses responding to this survey recognize the importance of familiarity with mTBI to their practice but clearly self-identify knowledge deficits in all aspects of care of mTBI patients. This means that a broad but succinct curriculum for the nonadvanced practice bedside nurse is needed to provide a cost-effective, quickly accessible way to afford the needed education. The next step in this study will be the generation of an mTBI course that meets these requirements and provides the beside nurse with the knowledge, skills, and abilities to care for this important segment of the neuroscience patient population.

Acknowledgments

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