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ORIGINAL ARTICLE

School nurses' perceptions and experiences with an interprofessional concussion management team in the secondary school setting

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ABSTRACT

Following a concussion, both cognitive and physical rest are imperative aspects of injury management. The inclusion of academic adjustments and the formation of an interprofessional concussion management team (ICMT) provide a mechanism to manage academic issues following a concussion. As one of the sole healthcare providers presents during school hours, the school nurse may offer unique insight regarding the infrastructure of an ICMT in the secondary school setting. The purpose of this study was to explore school nurses' perceptions of and experiences with an ICMT for adolescents following a concussion in the secondary school setting. The consensual qualitative research approach was used to guide this study. Semi-structured individual telephone interviews were conducted with 15 school nurses employed in the secondary school setting across the United States. During data analysis, themes and categories were established based on a consensus process by the research team. Study findings indicated that school nurses identified several stakeholders regarding the concussion management team that are essential to include in the concussion management process. In addition to the school nurse, participants perceived an ICMT should include a physician, athletic trainer, school counsellor, teachers, and other stakeholders such as the patient and their parents. Additionally, participants discussed their perceptions of their own role as a member of an ICMT in the secondary school setting. The inclusion of an ICMT to aid the recovery following a concussion is vital to ensure proper care for the adolescent patient. Furthermore, the school nurse and athletic trainer must effectively collaborate, when possible, to ensure that concussed adolescents are allowed sufficient cognitive rest via the incorporation of academic adjustments during the recovery process.

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Introduction

Concussions are a growing public health concern due to the potential for long-term physical, emotional, and cognitive ramifications (Broglio et al., 2014). In the United States, it is estimated that 1.1–1.9 million sport-related concussions occur annually in adolescents under the age of 18 (Bryan, Rowhani-Rahbar, Comstock, & Riveria, 2016). The prevalence of concussive injuries amongst adolescents has not only led to significant efforts to increase public awareness (Rivara et al., 2014), but also to the mandate of state concussion laws regarding the evaluation of concussions (Harvey, 2013).

While previous research has primarily focused on the evaluation of concussions and appropriate management including return to activity or sports participation, minimal evidence exists addressing how to safely return an adolescent with a concussion to the classroom to fulfill their primary role as a student (Halstead et al., 2013; Iverson & Gioia, 2016; McGrath, 2010). Since symptoms of a concussion can impact learning, academic adjustments may be required to help the student return to a full cognitive load in the classroom environment (i.e. return-to-learn; Halstead et al., 2013; McCrory et al., 2013; Valovich Mcleod, Houston, & Welch, 2015). Academic adjustments assist the concussed adolescent within the classroom while completing their coursework and participating in school activities at a level that is tolerable and does not exacerbate symptoms (Halstead et al., 2013; Sady, Vaughan, & Gioia, 2011). Therefore, appropriate concussion management should include a multifaceted approach and should incorporate collaborative management amongst several individuals of various professions to permit a safe return to both activity and the classroom (Baker et al., 2014; Broglio et al., 2014; Gioia, Schneider, Vaughan, & Isquith, 2009; Halstead et al., 2013).

The concussion management team

Due to the multidimensional nature of concussion, the inclusion of an interprofessional concussion management team (ICMT) is recommended (Broglio et al., 2014; Hossler, McAvoy, Rossen, Schoessler, & Thompson, 2014; Iverson & Gioia, 2016; Valovich Mcleod et al., 2015). The concussion management team may consist of an athletic trainer, directing physician, family or community physician, neuropsychologist, parents, teachers, school nurse, school administrators, and school counsellors (Broglio et al., 2014; Lueke, 2011; McCrory et al., 2013;

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Schmies, 2014). Physicians, athletic trainers, and school nurses are the typical healthcare professionals responsible for the physical management of concussion in the secondary school setting, including the stepwise return-to-activity progression. However, since academic adjustments may be needed to promote cognitive rest following a concussion, school counsellors, teachers, and other school personnel should be included as a part of the ICMT to help manage a return-to-learn progression for the concussed adolescent prior to the start of a return-to-play progression (Broglio et al., 2014; Halstead et al., 2013; Iverson & Gioia, 2016; Lueke, 2011; McCrory et al., 2013).

While best practice guidelines recommend key stakeholders of an ICMT, the specific roles of each team member may still be unclear. As one of the sole healthcare providers present during school hours, school nurses may offer unique insight regarding the structure and collaboration of an ICMT in the secondary school setting. Therefore, the purpose of this study was to explore school nurses' perceptions of and experiences with an ICMT in the secondary school setting.

Methods

The consensual qualitative research (CQR) approach was used to guide this qualitative study. The CQR approach integrates qualitative methods to provide an in-depth theoretical framework of participants' experiences (Hill et al., 2005; Hill, Thompson, & Williams, 1997) and has been previously established in athletic training research (Phan, McCarty, Mutchler, & Van Lunen, 2012; Thrasher, Walker, Hankemeier, & Pitney, 2015; Welch et al., 2014a, 2014b; Welch Bacon, Kay, & Valovich Mcleod, Accepted). The CQR tradition involves the inclusion of multiple researchers to gain different insights about collected data and allows for an in-depth and descriptive look at participants' collective experiences (Hill et al., 2005, 1997). This study was designed to be an inductive interpretation into what school nurses' perceived or have experienced to be important ideas regarding concussion management in the secondary school setting.

Data collection

School nurses employed in the secondary school setting were recruited for participation in this study. Criterion-based sampling was used to recruit potential participants from a convenience sample of school nurses who previously participated in a study exploring beliefs, attitudes, and knowledge of academic adjustments (Weber, Welch, Parsons, & Valovich Mcleod, 2015). School nurses were recruited for this study if they met the following pre-determined criteria: (a) were a participant in a previous study (Weber et al., 2015), (b) provided consent during the previous study to be contacted for a follow-up telephone interview, (c) had at least five years of experience as a school nurse in the secondary school setting, and (d) had at least one concussed adolescent that received academic adjustments in the past year during the time of the study. Participants were randomly selected from 296 potential individuals who met all of the predetermined criteria. According to Hill et al. (2005), it was anticipated that 10–15 participants were needed to achieve data saturation via the CQR design.

The interview schedule for this study was adapted from a previously developed interview that explored athletic trainers' perceptions of academic adjustments for adolescents following a concussion (Welch Bacon et al., Accepted). Interview questions were modified to explore school nurses' perceptions of and experiences with the management and care of concussed adolescents. The semi-structured interview schedule consisted of 12 open-ended questions as well as probing questions in areas where more information may be necessary.

The principal investigator (CWB) sent an email to potential participants inviting them to participate. The email included the purpose of the study, contact information of the principal investigator, and a request for participation. Once an individual agreed to participate, an interview was scheduled via telephone, and the participants provided some contextual information about themselves. Each interview lasted approximately 30–45 minutes. Phone interviews continued until data saturation was achieved. For this study, the research team confirmed that the data were saturated (i.e. no new information was attained from participants) following the completion of 15 individual participant interviews. All participants were female and were employed in secondary schools across nine US states. Participant information is displayed in Table 1 (pseudonyms were provided to protect the participants' identity).

After each interview was conducted, the audio file was transcribed by a professional transcription company. During transcription, proper names, places, or other identifying information were redacted to protect the participant's anonymity. Following transcription, transcripts were sent back to the participants for a member check (Patton, 2002) to ensure trustworthiness of the data and to allow the participant to provide any additions or clarifications to their initial responses. However, participants were informed that the information already included in the transcript could not be altered or deleted in any way. Of the 15 participants, two individuals provided further insight or additional information to their transcripts. The additional responses were included during the coding phase of the data analysis.

Table 1. Participant information.

Participant pseudonym	Years of experience as school nurse	Years at current secondary school	Type of secondary school
Alexis	17	17	Public
Annie	16	16	Public
Ellen	18	15	Public
Emma	8	5	Public
Lexi	30	30	Public
Mallory	8	8	Public
Melanie	8	3	Public
Rachel	15	4	Private parochial
Sammie	21	21	Private military board
Tabitha	20	20	Public
Stacy	11	9	Private parochial
Val	18	18	Public
Virginia	12.5	2.5	Independent
Sydney	12	3	Public
Lisa	15	10	Public

Table 2. Roles and experiences of the research team.

	Researcher #1	Researcher #2	Researcher #3	Researcher #4	Researcher #5
Study role	Principal Investigator; Research team member	Research team member	Research team member	Research team member	Internal auditor
Qualitative Experience	Experienced qualitative researcher with expertise in CQR	Novice qualitative researcher new to the CQR approach	Experienced researcher with previous experience in CQR	Experienced researcher with previous experience in CQR	Experienced qualitative researcher with familiarity of the CQR approach

Data analysis

The research team for this study consisted of five athletic trainers with varying levels of CQR experience (Table 2). Including novice researchers during CQR data analysis has been reported as an advantageous approach to allow for new perspectives to be considered (Welch et al., 2014a). Prior to data analysis, research team members were trained on the CQR data analysis process by the principal investigator. One member of the research team served in the role of internal auditor. The role of the auditor was to confirm that data saturation had been achieved, verify that the research teams' interpretations of the data were not biased, and ensure that the data were closely and appropriately analysed and that numerous perspectives were considered before the team reached a consensus (Hill et al., 2005, 1997).

Data analysis for this study occurred in four progressive stages: 1) ascertaining initial code domains, 2) extracting core ideas from each domain, 3) cross-analysing multiple participant interviews via development of categories and themes, and 4) identifying the frequency of participant cases per category (Hill et al., 2005, 1997). Initial code domains were developed and used to group data around comparable topics. After the domains were identified, the research team coded the initial transcripts and placed the data into a domain they deemed fit. From coding multiple transcripts during this phase, the researchers gained a greater understanding of the content that represented each domain. Once the data were placed in domains, the next phase of data analysis involved building core ideas from each domain, also known as abstracting (Corbin & Strauss, 2015). Next, the research team cross-analysed multiple participant interviews to determine relationships, similarities, and differences that the interviews displayed when looked at in unison. By doing so, it allowed the researchers to distinguish categories in which the core ideas were placed. The categories that were derived during data analysis were not established from previous literature or preconceived ideas (Hill et al., 2005, 1997).

Once cross-analysis was completed, the frequency of occurrence for all categories was tabulated. Frequency counting enabled the research team to determine how often each category was applied across all participant cases, which provides a sense of the representativeness of the entire sample (Hill et al., 2005, 1997). Frequency was divided into four subsections for each category (i.e. general, typical, variant, rare). For this study, a category was considered general if it applied to all or all but one of the 15 participant cases, typical if it applied to eight or more of the cases, variant if it was labelled to less than eight of the cases, or rare if the data related to only two or three of the participant cases.

Ethical considerations

This study was approved by the University Institutional Review Board. All participants provided written consent via email before data collection as well as verbal consent at the beginning of the telephone interview to have the interview recorded.

Results

The data presented are part of a larger study pertaining to school nurses' experiences with academic adjustments for concussed adolescents. During data analysis, five main themes emerged. However, this manuscript will only focus on the concussion management team theme.

The concussion management team

Data analysed from the concussion management team theme were further reduced into six categories: physician, athletic trainer, school counsellor, teacher, other members, and the role of the school nurse. The frequency of participant cases per category is displayed in Table 3.

Physician

Generally, school nurses described the physician as the primary individual of the ICMT that should recommend academic adjustments for concussed adolescents, but struggled with the lack of consistency between physicians regarding the actual prescription of academic adjustments. Alexis commented, "The academic [adjustments] will vary based on what the prescribing doctor has recommended and then we follow those as a guideline." Similarly, Lindsey commented:

> For physicians, and local paediatricians, since the state requires [physicians] at the end to sign off and I believe it says that [physicians] are qualified and knowledgeable in the treatment of concussion, they are responsible for the whole care for that student. So, if they do not prescribe academic [adjustments], I cannot tell them what they need to be doing because they are supposed to be the expert. However, I can let the parents know that [academic adjustments] would be helpful and they can talk to their doctor.

Table 3. Participant cases by category.

Category	Frequency	Number of participant cases
Physician	Typical	8
Athletic trainer	Typical	11
School counsellor	Typical	13
Teacher	General	14
Other members	Typical	13
Role of the school nurse	Typical	11

Ellen discussed that the access adolescents have to different physicians can be a struggle because they are not all consistent with treatment recommendations. She remarked:

> There is sometimes miscommunication, depending on who [the adolescent] sees when they're diagnosed. The physicians who have more experience with concussions tend to tell the students to stay home for a day or two if their symptoms are really bad, which usually is a really bad headache or dizziness. Some other doctors who may not see as many concussed adolescents, like general practitioners sometimes tell [the adolescent] to stay home for several days.

Tabitha remarked that although the academic adjustments are prescribed by the physician, it takes a collaborative team approach to ensure they are implemented effectively. She commented:

> The [academic adjustments] can be created by the doctor based on knowing what the student usually needs. The adjustments are then [implemented] by the guidance counsellor, myself, and the teachers. The teachers are given the information and are told what adjustments should be made and they are the ones that set them in place. We do follow-up with [the adolescent] periodically depending on their symptoms.

Tabitha also indicated that each physician prescribes different academic adjustments by stating, "[we] take the cue from the doctor depending on who [the adolescent] goes to."

Athletic trainer

Along with the physician, school nurses discussed the role the athletic trainer should play as a member of the ICMT. Participants particularly commented on what they believe that the role of the athletic trainer should be, and how communication was sometimes difficult since the athletic trainer was usually present only after school hours. Alexis expressed:

> Because of the practices and games, [the athletic trainer] doesn't start until 1 o'clock in the afternoon usually. So, it is the nurse that will be the one that will have to initiate [academic adjustments].

In addition, she remarked:

> The athletic trainer rarely communicates with anybody in the school other than the nurse, and that's mostly because they are not in the school during the day.

Ellen stated that she felt that her athletic trainer was more responsible for returning the concussed adolescent to activity, while Sydney commented on the communication between herself and the athletic trainer, "each Monday the athletic trainer sends me an email with a list of who has a concussion from the previous week."

In rare instances, school nurses discussed their responsibilities for concussed adolescents when an athletic trainer was not employed. Melanie remarked:

> If an [adolescent] has a concussion, I end up dealing with them because we do not have an athletic trainer at the school. I work with the doctor to determine when [the adolescent] is ready to return to school or play.

School counsellor

School nurses described that while the school counsellor did not have a large role on the concussion management team, they served a positive role. Participants discussed how the school counsellor was likely to get more involved when the concussed adolescent was struggling mentally and emotionally, and how they can be a great point of support for the adolescent during recovery. Alexis remarked:

> A number of our concussions have been really, really mild and sometimes the school counsellors never even get involved because we have been able to handle it without the need of a 504 [plan].

Ellen highlighted that school counsellors did not feel qualified when it came to a concussed adolescent:

> [School nurses are] getting more involved with making the academic adjustments and communicating with the teachers for [concussed adolescents]. That used to be more like an academic counsellor type of task, they didn't feel like they were qualified regarding concussion, so the district moved it back to the school nurses.

Rachel commented that the role of the school counsellor was to serve as liaison to the teachers and to communicate the necessary academic adjustments with them:

> [School nurses] cannot go into a classroom and say, "Hey, are you implementing this? Is it working? Is it not working?" So, that role goes to the school counsellor more than the school nurse.

Emma discussed the school counsellor's role when behavioural issues occur for adolescents following a concussion by stating:

> When [the concussed adolescent] has psychological issues and they get more depressed or they're acting out more behaviourally, we direct those more towards our counselling department.

Emma also commented on the heavy workload of school counsellors:

> I wish our school counsellors were more involved following a concussion. However, [school counsellors] feel they have enough on their plate, and [concussion] is not something that they really want to add to their plate.

Teacher

School nurses also discussed teachers as important members of the ICMT. Participants commented on what they perceived the teacher's role should be in the execution of academic adjustments in and beyond the classroom. In addition, participants suggested that most teachers have the ability to determine when an adolescent is struggling in the classroom and should take charge to facilitating academic adjustments into the classroom. Sammie stated:

> Teachers are included as part of the [concussion management] team on an individualised basis and we discuss how they can accommodate the adolescent based on the subject they teach. It is easy for teachers to identify if [the adolescent] is not doing well because they are so focused on the specific content they teach.

Emma expressed that most teachers are flexible on implementing academic adjustments in the classroom by commenting, "[teachers] are more than willing to work with us to get things done." Tabitha commented that it is the school nurse's responsibility for initiating academic adjustments, but the teacher should be responsible for the actual implementation. She noted, "it is mostly the school counsellor and myself that

identify the necessary adjustments and then the teachers actually implement them."

While participants described the perceived role of the teacher as part of the ICMT, they also discussed the need for more teacher-focused education regarding concussions and their potential effects on the learning process. Mallory remarked:

> I think that for the most part we have some teachers that are fine with [academic adjustments] and feel the [adolescent] does not even need to make up all this work and are really great with the students, whereas other teachers are a little more strict and I have to remind a few of them of the student's concussion. Sometimes [teachers] have a hard time with concussions because a student can feel fine and be acting fine, but still be having symptoms and the teacher sees them joking around maybe with their classmates or occasionally doing something after school that you wouldn't think they should be doing. Some teachers do not understand why the adolescent doesn't just stay home if they are symptomatic. So, I try to explain that it is important to see if they can tolerate the change in environment before they progress to full return-to-school. So, it sometimes requires constant education and just reinforcing the reasons why we incorporate academic adjustments.

Sydney perceived that teachers are always learning about academic adjustments. She remarked, "It's been kind of a learning process and [teachers] do not always understand that [concussions] are real and [academic adjustments] are necessary." Similarly, Lindsey commented, "initially it took a lot of education to get [teachers] on board."

Other members

School nurses described their general perceptions of the ICMT as a whole and the importance of including other members, such as parents and school administrators. Tabitha felt that most of her parents understand the need for academic adjustments and cognitive rest. She remarked, "the parents seem to take concussions and returning to the classroom seriously." Ellen commented that sometimes it is the parents that request academic adjustments, but that it always comes down to a collaborative decision:

> [Academic adjustments] are often requested by parents, but ultimately, it is a team decision. If we are accommodating [the adolescent], we need to make all the adjustments and accommodations, [in accordance with the] concussion protocol.

Alexis noted that school administration usually is not involved, but in some instances they can be. Specifically, she stated, "In rare cases if major [academic] accommodations have to be made, then administration will be called in to approve the accommodations." Val discussed the importance of a collaborative approach to recovery and the need to include various stakeholders:

> In addition to the school counsellor, athletic trainer, and myself, we also keep the building principal updated on what is going on. We also work closely with the attendant secretary to make sure that she knows what is going on with the student, because sometimes in their accommodations, they cannot do a full day of school. So, if [the adolescent] does a partial day or we have to adjust their schedule, we work with the attendance secretary. We just work with the other people in the building to keep them informed on what is going on.

The school nurse role

School nurses discussed their perceptions of other school nurses and how their education levels and experiences affected their role on the ICMT. Overall, participants perceived that most school nurses did not know what their specific role in the concussion management process should be. Alexis stated, "I think [school nurses] should be part of a concussion management team, but we should not be the sole [member]—it takes a team approach." Similarly, Lindsey commented that school nurses should have a major role in concussion management because it is a health issue. "I think [school nurses] have a major role. I think because it is a health issue that is affecting the brain, the school nurse is really valuable in assessing students." Annie remarked that school nurses should be on the concussion management team because they are licensed medical personnel:

> I think that a school nurse should be involved especially if there is not an athletic trainer in the school. The school nurse is the only other person in the school that has a healthcare background and should have the knowledge to look at the relationship of concussion to academics. I think that the school nurse should definitely be involved in all aspects of concussion, both in return-to-play and return-to-school.

Participants also discussed their education and training regarding academic adjustments as part of concussion management. According to Emma, school nurses learn about academic adjustments following a concussion through professional experience. She noted, "I think it's more through professional experience. I did not learn anything about [academic adjustments] for concussion in any of my schooling at all. It's all from what other people teach you." Mallory discussed how concussion education amongst school nurses has improved over the years:

> I think that [concussion education] is getting better. I think that there has been a lot of push to educate school nurses on this, and I think that a lot of them are pretty much on board with it now, but I think that a couple of years ago they probably were not. I think now that there is a real push to educate all school nurses on concussion issues and accommodating the students that have been diagnosed with them. So I think that most school nurses are much better at [concussion management] than they used to be.

Similarly, Melanie commented:

> School nurses are certainly better educated now than we were five years ago. Five years ago I didn't know how to properly advise our parents of kids that had concussions. I didn't know exactly what they should do or the different restrictions that should be put on homework time and computer time. I didn't even know what the children should or should not be doing at home. So, I think that [school nurses] are doing much better, but I still think that there is room for improvement.

Rachel suggested that both local physicians and school nurses do not have the same understanding regarding concussions by noting, "I think the doctors in the community are not all on the same page and well educated on concussion, and I would have to say that school nurses probably are not as well."

Discussion

Concussion provides a unique condition in which an interprofessional team is required to adequately diagnose, assess, treat, and manage the injury. Unlike most injuries or illnesses, a concussive injury also requires collaboration with non-healthcare providers to facilitate recovery. Interestingly, our findings suggest that although individuals from a variety of professions should be included in the concussion management team, a lack of understanding regarding established team roles as well as a lack of communication amongst team members highlight the need for further education amongst healthcare providers and school personnel to provide appropriate patient care.

As noted by our findings, in order for academic adjustments to be a valuable tool in the return-to-learn process, a concussion management plan should be established. This plan should include the importance of and procedures for academic adjustments and establish the roles of the ICMT (McGrath, 2010; Moser, Schatz, Glenn, Kollias, & Iverson, 2015). In the current study, participants identified physicians, athletic trainers, school counsellors, teachers, parents, administration, and school nurses as necessary members of the ICMT. These findings align with best practice recommendations, which suggest that the concussion management team should follow a collaborative approach between family (parents, patient), school personnel (teachers, administration, counsellors, coaches), and medical community referral sources, such as a team physician or other healthcare referral sources (Broglio et al., 2014; Halstead et al., 2013; McCrory et al., 2013). Results from this study also indicate that while the majority of recommended team members were identified by the participants, actual access to or participation from the various concussion management team members varied. Interestingly, school nurses placed a larger emphasis on the role of school nurses and teachers, because of ease of contact. Due to similar schedules, school nurses may have a majority of contact with teachers throughout the school day. However, other school personnel, such as school counsellors and administrators, are an important part of the concussion management team and may influence the likelihood that the necessary adjustments are implemented. In addition to teachers, school counsellors may be able to provide insight on how the adolescent is performing academically as well as monitoring symptoms that may develop from cognitive stressors (McCrory et al., 2013). However, due to their involvement in numerous responsibilities, it is possible that school counsellors may not have sufficient time to be intimately involved in the ICMT. Therefore, in situations when not all of the mentioned healthcare providers or school personnel are available, it is important for the concussion management team to delegate roles and responsibilities to other team members.

Concussions are often treated differently than other injuries in the secondary school setting because proper management requires that care is provided to the patient academically as well as physically (Halstead et al., 2013; McGrath, 2010). Ideally, the roles for each member of the ICMT should be clearly defined in the school's concussion management plan (Broglio et al., 2014). Furthermore, there should be a point person that can manage team members appropriately. Current literature suggests that point person should be either the athletic trainer or school nurse (McGrath, 2010; Weber et al., 2015). School nurses and athletic trainers are both qualified medical personnel suited to be the point person and are often the two medical providers on-site in secondary schools. In the secondary school setting, close to 65% of secondary schools have access to an athletic trainer (Pryor et al., 2015). Athletic trainers are healthcare providers who work under the direction of a physician and specialise in the prevention, evaluation, management, and rehabilitation of injuries occurring sport and physical activity (National Athletic Trainers' Association, 2016). One unique characteristic of the athletic trainer is their constant presence at the school and their ability to re-evaluate patients on a daily basis. Because of this, many medical groups recognise the importance of the athletic trainer as a primary point person on the concussion management team.

School nurses in this study did not highlight the athletic trainer or physician as having a large role in the concussion management process, which contradicts current recommendations. Lack of an emphasis on the athletic trainers' role as a member of the ICMT could relate to school nurses' limited access to or collaboration with an athletic trainer in the secondary school setting. Mummert et al. (2014) reported that only 41.6% of school nurses have an established relationship with an athletic trainer in the secondary school setting. Furthermore, only 50% of school nurses that have access to an athletic trainer collaborate the care of a concussed adolescent (Minthorn, Welch, Weber, Mayfield, & Valovich McLeod, 2014). Therefore, it is possible that school nurses in the current study did not emphasis the role of the athletic trainer as a member of the ICMT due to a lack of access or collaboration.

In addition to school-affiliated healthcare professionals, community-based medical professionals should be included in the collaborative group of members of the concussion management team. These medical personnel can include the team physician, family physician, or a trained concussion specialist (Halstead et al., 2013). These personnel are typically more involved with the return-to-sport aspect of concussions but have a crucial role in the return-to-learn. Unfortunately, it is reported that only 16% of school nurses have access to a sports medicine physician and 25% of school nurses report no reputable relationship with other clinical personnel (Mummert et al., 2014). Not having access or relationships with other clinical personnel that specialise in concussions can hinder the opportunity to have a well-rounded ICMT for the purpose of improving patient outcomes.

When there is limited availability of concussion specialists, family practice physicians are often the care providers for concussed adolescents. In fact, Arbogast et al. (2016) reported that more than 80% of concussed patients enter the healthcare system through primary care or outpatient services rather than via an emergency department visit. However, participants in this study stated that recommendations for academic adjustments are not consistent amongst physicians. This inconsistency can negatively affect the adolescent's outcome

and lead to unnecessary physician visits and confusion amongst patients and families (Beatty, Harris, & Barnes, 2010; Zonfrillo et al., 2012). Additionally, some evidence suggests that physicians are lacking adequate knowledge of the concept that is return-to-learn. Pleacher and Dexter (2006) reported that 64% of physicians identified cognitive rest as a best practice recommendation for concussion management, but of those, only 2% were able to describe what academic adjustments were. Furthermore, only 28% of those patients were provided with instructions regarding return-to-learn (Pleacher & Dexter, 2006). Most of the school nurses in this study mentioned the physician as the primary prescriber of academic adjustments. Therefore, it is imperative that all personnel involved with the concussion management process are well versed on cognitive rest and the importance of academic adjustments and communicate these plans to the rest of the concussion management team.

Lastly, the participants in this study commented on the parents and adolescents themselves as being key members of the concussion management team. Parents and adolescents can be given vital information regarding what to expect during the course of injury and should be involved in the decision-making process. Additionally, while the patient is able to relay vital subjective information regarding symptom status during recovery, parents have the ability to provide insight regarding the adolescent's changed behaviour at home and struggles outside of the school environment (Halstead et al., 2013; McCrory et al., 2013). Since concussion diagnosis, treatment, and recovery are often based on patient self-report symptoms, the inclusion of the perspective from both the patient and his/her parent is crucial. However, while state concussion laws attempt to include parents as key stakeholders, the specific roles, and responsibilities of parents as members of the ICMT still remain unclear (Cremer, 2016). As of 2016, 86% of states require parents to receive some form of concussion education as part of state law, yet only five states require parents to notify healthcare professionals or school administrators if they suspect their child has a concussion and only four states require the parent be notified if a concussion is suspected (Cremer, 2016). Regardless, in order to enhance the patient experience during recovery and promote a shared decision-making framework, the patient and his/her parent must serve as key members of the ICMT.

Following best practice recommendations (Halstead et al., 2013), participants in this study agreed that school nurses should play a role in the ICMT, yet perceptions of specific role varied. Generally, participants agreed school nurses should be a member of the team, but not the sole member. However, some school nurses indicated that they were the often point person on the concussion management team and only involved other personnel if they felt that it was needed. Weber et al. (2015) reported that school nurses were moderately to extremely familiar with academic adjustments. Regardless, despite school nurses' familiarity with the need for academic adjustments during recovery from a concussion, it is recommended that other members should be included in the concussion management team to ensure a collaborative and well-rounded approach to return-to-learn and return-to-activity following a concussion.

Participants in the current study identified that school nurses globally lack education focused on concussion management and the role of academic adjustments. It has been reported that while a majority of school nurses recognise the signs and symptoms of a concussion, 20% perceived they did not have the essential training to implement academic adjustments as a part of concussion recovery (Wing, Amanullah, Jacobs, Clark, & Merrit, 2016). These findings suggest that school nurses need additional specialised training on the management of concussions, including the return-to-learn process (Wing et al., 2016). Contrary to other findings (Wing et al., 2016; Weber et al., 2015), our participants felt equipped enough to partake in interprofessional collaboration on the concussion management team in order to allow for successful implementation of academic adjustments. According to the National Association of School Nurses, a school nurse's role is to provide concussion education to parents, students, and staff, recognise potential concussions, advocate for concussion prevention, aide in the adolescent's progression of academic activity, and communicate with the athletic trainer in regards to the student's progress (Diaz & Wychoff, 2013). Therefore, with proper training and established plans for communication with other concussion management team members, school nurses could potentially be the leading member of the concussion management team, including serving in the role of educator and working to enhance communication as the liaison between other team members (Rains & Robinson, 2010).

It is important to note that our findings represent the perspective from one member of the ICMT. While the ICMT should be comprised of numerous individuals from various professions, it is important that an established team is able to function on both an interpersonal and interprofessional level (Croker, Trede, & Higgs, 2012). To do so, education on each profession may be necessary to ensure that each member of the ICMT is fully knowledgeable of the roles and professional abilities of the other team members (Baxter & Brumfitt, 2008). Additionally, it is possible that the team dynamic may be influenced not only by the environment but also by professional and interprofessional agendas as well; therefore, it is essential that ICMT members establish clear guidelines to ensure that individuals do not overstep the scope of their professional role (Kvarnstrom, 2008). Thus, as participants' themselves noted, school nurses should be a part of a larger team in order to fulfil the overall needs of the injured patient, but should not be the sole individual responsible for the care of a concussed adolescent. School nurses have a unique background and perspective working within the school setting to provide immense value to the ICMT. How school nurses view their role within this team may be shaped by social role theory. Blakely and Dziadosz (2015) describe social role theory as the way in which "members of a culture or society come to know the expected social role behaviours of social positions through socialisation, the context of an individual's social experience" (p. 184). Through interactions, socialisation is considered to be a lifelong process in which individuals learn norms and customs that are important for that particular context Richards (2015). Therefore, it is possible that socialisation as a school nurse has influenced how

they perceive their role within the ICMT. From our results, school nurses acknowledged their lack of education on academic adjustments following a concussion. Drawing from their experiences, participants drew this conclusion and could potentially explain why participants believed that they should be involved in concussion management but not the sole provider.

The participants from this study were selected from a convenience sample of school nurses who were participants in a previous investigation that assessed their familiarity, attitudes, and beliefs of academic adjustments as part of the concussion management process (Weber et al., 2015). Due to the anonymity of the previous investigation, we were not able to compare the qualitative responses from this study to the quantitative self-reported data previously collected.

Future research should evaluate the beliefs, attitudes, knowledge, and familiarity of academic adjustments amongst other healthcare professionals and school personnel who work with adolescents following a concussion. The results from those studies could be useful in defining what these personnel know and perceive about academic adjustments and if they are able to aide in a successful return-to-learn. More research is needed also to understand which factors allow for successful implementation of policies and procedures for concussions.

Concluding comments

Since cognitive rest is a cornerstone in concussion management, it is imperative a concussion management team is established and that all members are well versed in the return-to-learn aspects of concussion management. This interprofessional approach to concussion management follows best practices, but also allows for well-rounded care, including academic accommodations if necessary, for the concussed adolescent. While individuals included in the ICMT may differ by school, members should include both medical and school personnel. Interprofessional care is essential in proper concussion management. However, barriers towards interprofessional collaboration for concussed adolescents exist and should be studied further. An understanding of team members, roles, and barriers may assists secondary schools in developing concussion management plans and policies that utilise best practices and include a interprofessional, collaborative concussion management team.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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