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## Interprofessional Collaboration to Support Children with Diabetes

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## Interprofessional Collaboration to Support Children with Diabetes

### Abstract

*Background:* The purpose of this study was to investigate school nurses' perspectives related to interprofessional collaboration to support health promotion and development of self-management skills of students with diabetes.

*Method:* A link to an on-line survey was sent to 312 school nurses. The survey included 11 items pertaining to the nurses' perceptions.

*Results:* The majority of the respondents (91.8%,  $n = 56$ ) reported that instruction and maintenance of diabetes self-management skills would benefit from an interprofessional team. Few of the respondents (20.8%,  $n = 11$ ) identified occupational therapy practitioners as possible collaborators. Nearly two-thirds (62.7%,  $n = 37$ ) of the respondents suggested that students' lack of incorporated self-management strategies into their daily routines was a concern. Half of the nurses (50%,  $n = 30$ ) believed that students were concerned with how to process their emotional reactions related to diabetes, and most of the respondents (80.33%,  $n = 49$ ) identified the need for students to develop strategies to deal with unanticipated events around diabetes management.

*Discussion:* Diabetes is complex, and students with diabetes would benefit from an interprofessional team approach at school. More research is needed to understand why occupational therapy practitioners were infrequently endorsed by school nurses as possible collaborators.

### Keywords

Diabetes, Self-Management, Children, Interprofessional Collaboration

### Cover Page Footnote

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### Credentials Display

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Diabetes is one of the most prevalent chronic conditions in the United States affecting school-age children (American Diabetes Association, 2014). Children with type 1 or type 2 diabetes encounter multiple challenges that affect their performance as a student. Students with diabetes are more at risk than their classmates for inconsistent school attendance, strained peer relations, poor classroom performance, and associated mental health concerns (Jackson et al., 2015; National Association of School Nurses, 2016). School nurses are often viewed as the primary leaders in managing the health concerns of children at school (Wodrich, Hasan, & Parent, 2011). However, the complex nature of diabetes self-management may benefit from an interprofessional approach (Jackson et al., 2015) that includes occupational therapy practitioners.

School-based diabetes management is necessary for students' immediate and long-term health promotion, as well as their day-to-day performance at school (Jackson et al., 2015). For students to achieve optimal glycemic control, they must regularly check their blood glucose levels, eat a healthy diet, and engage in frequent physical activity. In addition, students may need to self-administer several injections each day or regularly check an insulin pump. The performance of such behaviors is critical, as is the negotiation of who (i.e., child or adult) will take responsibility for the implementation (Pelicanand, Fournier, LeRhun, & Aujoulat, 2015). Lifestyle interventions, specifically those that are incorporated into the students' daily habits and routines, are thought to be the most effective in promoting self-management, averting

the physiological effects of diabetes, and promoting overall physical and mental health (McGavock, Dart, & Wicklow, 2015). The health of children and youth with diabetes depends on their consistent use of effective and efficient performance patterns. Occupational therapy practitioners can support children and youth with diabetes to embed self-management tasks into daily routines, encourage engagement and exploration of developmentally appropriate occupations that promote healthy lifestyles, and help them to understand how the complexities associated with the daily management of diabetes will likely influence many of their choices (Pyatak, 2011b).

The literature suggests that each student with diabetes should have a comprehensive Diabetes Medical Management Plan (DMMP) that outlines the diabetes management tasks that will be performed at school, as well as who will perform them (Jackson et al., 2015). School nurses are often in charge of implementing the DMMP. However, limited funding may prohibit a school nurse from being in a school on a daily basis, therefore causing gaps in the essential services that students with diabetes should receive (Lineberry & Ickes, 2015; Nabors, Lehmkuhl, Christos, & Andreone, 2003). Several states have passed laws that allow health services usually provided by nurses to be provided by other qualified personnel through a process called *delegation* (American Nurses Association and the National Council of State Boards of Nursing, 2006). Many of the health promoting self-management skills that nurses usually teach students with diabetes at school are appropriate for delegation (Jackson et al., 2015). Occupational

therapy practitioner's ability to identify habits and routines that can promote adoption and maintenance of healthy behaviors (American Occupational Therapy Association [AOTA], 2015) makes us a fitting collaborator with school nurses in building these self-management skills in children with diabetes at school. Self-management skills and strategies are of importance, as they build a student's independence in monitoring his or her diabetes and can be incorporated into following a healthy diet, being active, blood glucose monitoring, and taking medication (American Association of Diabetes Educators, 2016).

Students who have an interprofessional team concentrated on supporting them through consistent intervention and uniform goals will likely experience greater outcomes than those who do not (Brierley, Eiser, Johnson, Young, & Heller, 2012; Jackson et al., 2015). Examples of this consistency may be related to agreement by the team on the methods the student will use to measure blood glucose levels, the intervals and frequencies for such measurements, and which discrete tasks related to measurement the student will perform. However, there is a lack of evidence that examines the specific roles that professionals, other than nurses, assume when supporting children with diabetes at school. School nurses are on the front line of diabetes care and are responsible for the DMMP. Their responsibilities associated with delegation mean that they often act as gate keepers when it comes to addressing self-management with children with diabetes at school (Brierley et al., 2012). The importance of school nurses'

health promotion and diabetes self-management cannot be undervalued. Therefore, the purpose of this study was to investigate school nurses' perspectives related to interprofessional collaboration to support health promotion and the development of self-management skills of students with diabetes.

## Method

### Research Design

We used a survey design for this study because it allowed us to collect data from a large group of school nurses from across the country (Fowler, 2013). For the purposes of this study, the participants were nurses practicing in the school setting (grades K-12). This study was approved and conducted in accordance with the guidelines of the university's institutional review board. The participants demonstrated consent by completing the on-line survey.

### Participants and Procedure

The authors used REDCap (Research Electronic Data Capture) software Version 5.8.2 (Vanderbilt University, Nashville, TN), an online survey development and data collection secure web application for building and managing online surveys. The participants were recruited via email using addresses available in the public domain on school district and nursing association websites. Three hundred and twelve school nurses from across the nation were emailed an invitation to participate in the study and a direct link to the online survey. The data collection period spanned 2 months, and two reminder emails were sent out 2 weeks and 1 month after the initial request; this

reminder strategy was incorporated to address non-response error (Dillman, Smyth, & Christian, 2009) and has been shown to improve response rates effectively (Engel, Jann, Lynn, Scherpenzeel & Sturgis, 2015).

### **Instrument**

Questions regarding occupational therapy practitioners were included to gain the perspectives of school nurses on the potential ways practitioners could contribute to an interdisciplinary collaboration supporting the development of self-management skills in children with diabetes at school. On the basis of a scoping review of the literature on interventions to promote diabetes self-management in children and adolescents (Cahill, Polo, Egan, & Marasti, 2016), we developed an 11-item questionnaire that included all closed-ended questions. Questions focusing on the potential for interprofessional collaboration included, “Which professionals do you feel are equipped to assist you in addressing the needs of students with diabetes?”, “Do you feel that the instruction and maintenance of diabetes self-management skills would benefit from an interprofessional team approach?”, and “Which of the following interventions do you think would benefit students to promote diabetes self-management skills?” This final question included interventions that are in the scope of occupational therapy practice to gain a better understanding of our potential role in this interprofessional collaboration. In addition, the survey content included participant demographics (five questions), and the investigation of the most pressing concerns related to the care of students with diabetes at

school. The questionnaire was kept brief to encourage participation.

The initial survey was distributed to a registered nurse who is also a clinical instructor and has experience in diabetes self-management in order to determine readability and appropriateness of question content. This review of the survey allowed researchers to identify potential problems with intent, clarity, and navigation (Dillman, 2000). Discussions and recommendation for alterations were given, and this information was then incorporated into changes for the final survey.

### **Data Analysis**

Data were analyzed using descriptive statistical methods and IBM SPSS Version 20 (IBM Corporation, Armonk, NY) and descriptive statistics were calculated for all questions.

### **Results**

Of the 312 surveys sent out, 15 surveys were returned as undeliverable. Sixty-one fully completed surveys were returned and were entered in the data set, yielding a 19.55% response rate. Table 1 provides the respondents' years of practice, professional degrees, credentials, and practice setting responses. Approximately half (49.2%,  $n = 30$ ) of the respondents had 13 or more years of practice experience and more than half (56.7%,  $n = 34$ ) obtained a bachelor's degree in nursing. Most of the respondents were registered nurses (93.4%,  $n = 57$ ) without certified diabetes educator advanced credentials (98.3%,  $n = 59$ ). More than half (52.5%,  $n = 31$ ) worked in elementary schools, with the remainder working in middle school/junior high (28.8%,  $n = 17$ ) and high school settings (18.6%,  $n = 11$ ).

**Table 1**

*Respondent's Years of Practice, Professional Degrees, Credentials, and Practice Setting (N = 61)*

Characteristic	n	%
<b>Years of Practice</b>		
Less than 1 year	4	6.5
1-3 years	8	13.1
4-8 years	11	18.0
9-12 years	8	13.1
13-20 years	17	27.9
20 years or more	13	21.3
<b>Highest Nursing Degree</b>		
Associate's degree	9	15.0
Bachelor's degree	34	56.7
Master's degree	16	26.7
Doctoral degree	1	1.7
<b>License</b>		
LPN/LVN	1	1.6
RN	57	93.4
Nurse Practitioner	3	4.9
<b>Certified Diabetes Educator</b>		
Yes	1	1.7
No	59	98.3
<b>Practice Setting</b>		
Early childhood education	0	0
Elementary school	31	52.5
Middle school	15	25.4
Junior high	2	3.4
High school	11	18.6

### Perceptions Related to an Interprofessional Approach

Most of the respondents (91.8%, n = 56) reported feeling that the instruction and maintenance of diabetes self-management skills would benefit from an interprofessional team approach. The majority of the respondents (86.8%, n = 46) identified classroom teachers as professionals that are equipped to assist in addressing the needs of students with diabetes, with approximately half (50.9%, n = 27) identifying school administrators and few respondents (20.8%, n = 11) identifying occupational therapists. Table 2 presents the school nurses' perceptions regarding who could collaborate on an interprofessional team to help to address the needs of students with

diabetes and includes additional responses not highlighted above.

**Table 2**

*Perceived Professionals Equipped to Assist in Addressing the Needs of Students with Diabetes (N = 53)*

Professionals	n	%
Classroom teacher	46	86.8
School administrator	27	50.9
Social worker	24	45.3
School counselor	23	43.4
Physical education teacher	22	41.5
Paraprofessional	19	35.9
School psychologist	11	20.8
Occupational therapist	11	20.8
Physical therapist	6	11.3
Speech language pathologist	4	7.6

Regarding skills an interprofessional team could help to address in children with diabetes at school, a majority of the respondents perceived eating a healthy diet and getting proper nutrition (87.5%, n = 49), learning about diabetes in general (83.9%, n = 47), exercising and an active life style (80.3%, n = 45), and education on how self-management fits into daily routines (78.6%, n = 44) as top priorities. Table 3 presents the school nurses' perceptions regarding the skills an interprofessional team could address to help students perform self-management of diabetes and includes additional responses not highlighted above.

**Table 3***Perceptions Related to Skills an Interprofessional Team Could Address (N = 56)*

Skills	n	%
Eating a healthy diet and proper nutrition	49	87.5
Learning about diabetes	47	83.9
Exercising and an active lifestyle	45	80.4
Education on how self-management fits into routines	44	78.6
Communicating about diabetes to parents and school personnel	42	75.0
Healthy weight management	39	69.6
Self-checking blood glucose levels	38	67.9
Self-administering insulin	37	60.7
Negotiating diabetes management tasks with parents and school personnel	34	60.7

**Perceived Self-Management Concerns**

Close to two-thirds (62.7%, n = 37) of the respondents indicated that one of their biggest concerns is that students have not incorporated self-management strategies into their daily routines. In addition, more than half of the respondents (59.3%, n = 35) indicated that they are concerned that families and parents do not follow diabetes guidelines at home and that students struggle with and/or choose not to monitor their diabetes. The respondents also identified that they were concerned that families and parents do not provide diabetes management supplies to the school (44.1%, n = 26) and that families and parents need to acquire more knowledge about diabetes (40.7%, n = 24). Nurses also indicated that they were concerned that school personnel do not prioritize diabetes management during the student's school day (39%, n = 23). Table 4 presents the nurses' perceived concerns related to diabetes self-management of children at school and includes additional responses not highlighted above.

**Table 4***Nurses' Perceived Concerns Related to Diabetes Self-Management of Children at School (N= 59)*

Nurses concerns	n	%
Students have not incorporated self-management into their routines	37	62.7
Families and parents do not follow diabetes guidelines at home	35	59.3
Students struggle with and/or choose not to monitor related symptoms	35	59.3
Families and parents do not provide management supplies to the school	26	44.1
Families and parents knowledge about diabetes	24	40.7
School personnel do not prioritize management during the student's school day	23	39.0
Families and parents financial resources to manage care	15	25.4
Students that are reluctant to seek support from the school nurse	9	15.3

The nurses were also asked to take the perspective of students with diabetes, and two-thirds (66.7%, n = 40) of the respondents indicated that they believed students were concerned about making healthy choices for lunch or a snack. Half of the nurses (50%, n = 30) believed that students were concerned with how to process their emotional reactions related to diabetes. The respondents also identified that students may be concerned about how to prioritize diabetes self-management over social participation and missing class/academic content due to visits to the nurses' office (48.3%, n = 29, respectively), as well as how to negotiate unanticipated events (46.7%, n = 28). Table 5 presents the nurses' perceptions of students' concerns and includes additional responses not highlighted above.

**Table 5**  
*Nurses' Perceptions of Students' Concerns (N = 60)*

Student concerns	n	%
Making healthy choices for lunch or snack	40	66.7
Processing emotional reactions to diabetes	30	50
Prioritizing self-management over social participation	29	48.3
Missing class/academic content due to visits to the nurse's office	29	48.3
Negotiating unanticipated events	28	46.7
Talking/explaining to peers about condition	26	43.3
Allocating time to take care of diabetes at school	22	36.7
Advocating for time to manage diabetes from school personnel	17	28.3
Missing out on social participation due to the need to perform self-management tasks	17	28.3
Dealing with stigma related to diabetes	15	25.0
Missing school due to diabetes-related complications	14	23.3
Lack of participation in extra-curricular activities	6	10.0
Locating a space to perform diabetes self-management tasks	5	8.3

### Perceived Beneficial Interventions for Diabetes

#### Self-Management Skills Promotion

Most of the respondents (80.33%, n = 49) perceived developing strategies to deal with unanticipated events and developing a peer social support network that is understanding of diabetes self-management (73.8%, n = 45) as top priorities for interventions. Close to two-thirds (62.3%, n = 38) of the respondents reported developing strategies to advocate for additional diabetes self-management responsibilities as a beneficial intervention. More than half (57.4%, n = 35) perceived developing a strategy for inconspicuous blood checks and insulin injections and developing

a schedule for blood glucose monitoring (54.1%, n = 33) as interventions that would benefit students to promote diabetes self-management skills. Table 6 presents the interventions perceived to benefit students to promote diabetes self-management skills at school and includes additional responses not highlighted above.

**Table 6**  
*Interventions Perceived to Benefit Students in Promotion of Diabetes Self-Management Skills at School (N = 61)*

Intervention	n	%
Develop strategies to deal with unanticipated events	49	80.3
Develop a peer social support network that is understanding of diabetes self-management	45	73.8
Develop strategies to advocate for additional diabetes self-management responsibilities	38	62.3
Develop a strategy for inconspicuous blood checks and insulin injections	35	57.4
Develop a schedule for blood glucose monitoring	33	54.1
Develop a strategy for carrying diabetes supplies	31	50.8
Develop motor, process, and communication skills necessary to carry out diabetes self-management tasks	30	49.2
Develop strategies to combat stigma and conflict related to diabetes self-management at school	30	49.2

### Discussion

The nurses that participated in this study reported that interprofessional collaboration for diabetes self-management at school was valuable. However, less than a quarter of the respondents identified occupational therapy practitioners as possible collaborators to meet this aim. The majority of the respondents also indicated that the



inclusion of diabetes self-management tasks into the students' routines was an important focus for intervention. The need to balance successful performance in the student role with the challenges of managing a chronic health condition place great occupational demands on children with diabetes ( Locating a space to perform diabetes self-management tasks, 2011a). School nurses' capacity to meet the needs of all students they serve may be expanded if, based on the DMMP, they delegated the implementation of lifestyle interventions to occupational therapy practitioners and collaborated to achieve the integration of these recommendations into the school day.

More than half of the school nurses indicated that students with diabetes could benefit from support in dealing with their emotional responses to living with a chronic medical condition. Well-developed coping strategies and the ability to problem solve solutions during unanticipated events are thought to be important determinants of positive mental health in children with diabetes (Jackson et al., 2015). Emotional functioning and mental health status are strong indicators of health-related quality of life (Matza, Swensen, Flood, Secnik, & Leidy, 2004). School teams, including educators, school nurses, and school psychologists and counselors may collaborate with occupational therapy practitioners to adopt a strength-based approach when trying to address the mental health needs of children with diabetes. Such an approach would allow the team to capitalize on students' strengths and proficiencies to offset their challenges related to diabetes self-management (AOTA, 2012). Carefully evaluating

the challenges posed by the environment and the deficiencies associated with specific diabetes self-management tasks (e.g., reading the demarcations on a syringe) could provide the basis for targeted interventions that promote capacity building and offer opportunities to experience success (AOTA, 2012).

The inclusion of occupational therapy practitioners on school teams for children with diabetes could be highly beneficial and result in exciting practice opportunities. However, school-based occupational therapy practitioners have identified that limited time and resources often limit their ability to engage in new initiatives (Cahill, McGuire, Krumdick, Lee, 2014). A workload model, where occupational therapy practitioners have time built in their schedules to see students beyond those who have individualized education plans, may provide school-based occupational therapy practitioners with a structure in which to more collaborate frequently on interprofessional teams and provide services to children, like those with diabetes, who are not typically included on their caseloads. A strong argument for establishing workload formulas as well as implementing these for best practice has already been provided in the literature (Jackson, 2013).

### **Limitations and Future Research**

This study has several potential limitations. First, because the sample was established from contact information based in the public domain, it may not be representative of all school nurses in the United States. Second, collaboration with national and state-level school nursing associations may have yielded a higher response rate. Third,

although the survey was developed after a substantial literature review and the authors sought feedback from a practice expert, it was not formally validated. Finally, the use of only close-ended questions may have limited the school nurses' responses.

More research is needed to understand why school nurses identified certain school personnel over others for interprofessional collaboration related to health promotion and support for diabetes self-management. Research is also needed to identify successful interprofessional school-based interventions for diabetes self-management. Such research may serve as a model for the inclusion of occupational therapy practitioners in an interprofessional school-based approach. Creating such a model may encourage school nurses and other influential stakeholders (i.e., school administrators) to consider occupational therapy practitioners when designing and implementing DMMPs. Finally, more research is needed to better understand how actively providing intervention to students for diabetes self-management would impact school-based practitioners' workload.

### **Implications for Occupational Therapy**

The results of this study have many implications for occupational therapy practice. Occupational therapy practitioners should communicate with school nurses to determine the ways that they could support the implementation of a DMMP at school for children with diabetes. More specifically, occupational therapy practitioners should determine the best way for each individual child to incorporate self-management tasks into his or her daily routine. Further, occupational therapy

practitioners should work with school teams to adopt a strength-based approach when trying to address the mental health needs of children with diabetes. Finally, school administrators should consider the adoption of a workload model for occupational therapy practitioners. This model would afford occupational therapy practitioners the opportunity to engage more easily in interprofessional collaboration and address the needs of children who do not have an individualized education plan but who might benefit from occupational therapy services.

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