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# The Effect of School Based Nursing on Health Related Outcomes in Children: A Review of Literature

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The Effect of School Based Nursing on Health Related Outcomes in Children: A Review of

Literature

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### Abstract

*Background:* School nursing staff deal with acute, chronic, screening, and education issues in the school based clinic. It is the school nursing staff's role to provide care and treatment to children during school hours.

*Purpose:* Conduct a systematic review of the literature comparing disposition outcomes of children seen by school nursing staff to answer the PICO question: How does implementation of school based nursing affect health related outcomes in children within and outside the school environment?

*Methods:* Integrative literature review

*Description of Evidence:* Twenty research articles chosen from the database CINAHL, articles published within past nine years

*Critical Appraisal:* The articles cited present limitations of small sample sizes, narrow populations, all being found using one database, and not specifying the level of expertise for the school nurse. However, the methods used by the evidence collected were reliable and valid. These methods included surveys and descriptive methods such as journals and interviews from the school nurse.

*Synthesis:* The articles support the provision of school based nursing positively impact the health outcomes for children in school. The limitations create an opportunity for future studies.

*Recommendations:* Future studies should examine whether levels of education and licensure of the school nurse affect health outcomes.

## The Effect of School Based Nursing on Health Related Outcomes in Children:

### A Review of Literature

According to the U.S. Department of Health and Human Services (2013), “More than 10 million U.S. children under age 18 (14%) have been diagnosed with asthma. In 2012, 4.9 million children aged 3–17 had a learning disability (8%); 10% of boys had a learning disability compared with 6% of girls. In 2012, 8.8 million children living in the United States had an Emergency Department visit in the past 12 months (12%); 4.2 million children had two or more visits (6%)”. In addition, the U.S. Department of Health and Human Services (2013) states, “Nine percent of U.S. children under age 18 suffered from hay fever in the past 12 months, 11% from respiratory allergies, 6% from food allergies, and 12% from skin allergies.” These are just a few examples of conditions that children must cope with while simultaneously achieving requirement milestones in school.

Chronic conditions of childhood include asthma, obesity, diabetes, depression, and allergic reactions which must be managed and treated appropriately within the school setting as the child spends a large portion of his or her time in school. The school nursing staff needs to be able to manage the child’s condition so that the child’s chronic condition does not result in significant missed school time. According to the U.S. Department of Health and Human Services (2013), “One-third (18 million) of school-aged children (aged 5–17) missed no school in the past 12 months due to illness or injury.” This means that two thirds of these children did miss school due to an illness or injury. In addition, “Four percent of children missed 11 or more days of school in the past 12 months due to illness or injury.” It is important that chronic conditions be managed at school.

Other types of chronic conditions affecting children in school are behavioral issues such as violence, depression, substance abuse, and child abuse, all which may affect children's functioning in school. The school nursing staff may also be responsible for identifying children at risk for chronic conditions by conducting screenings, such as vision and hearing.

Treatment and management of chronic conditions may require a child or adolescent to visit the nurse's office. An example of a treatment that could be performed by a nurse is blood glucose level checks on a child or adolescent with Type I diabetes. After checking a blood sugar level, the nurse may need to administer the correct dosage of insulin. Medication administration is one of many roles performed by a school nurse in the school setting.

The school nursing staff must work with teachers and other faculty in order to educate them on health conditions adolescents and children may have and appropriate ways to react in different situations such as an allergic reaction. The nursing staff can perform assessments on children and adolescents who are feeling unwell and discuss health problems with a student who may be experiencing a problematic condition, especially as adolescents and children are constantly growing and changing.

The increasing prevalence of children with chronic conditions within school systems has increased the need for nursing staff. The purpose of this study was to conduct a review of the literature examining the disposition outcomes of children seen by school nursing staff. The outcomes result from interactions between children and nurse healthcare providers in the school system. These outcomes can include the child being sent home, back to class, or to a health care provider such as the Emergency Department. The study asks the research question, "How does implementation of school based nursing affect health related outcomes in children within and outside the school environment?"

### **Methods**

An initial literature search was conducted in the Cumulative Index to Nursing and Allied Health Literature (CINAHL) using the keywords ‘school nurse’ and ‘outcomes’. The initial search yielded 344 articles. Additional searches used various combinations of the terms. The keywords ‘school nurse’ and ‘diabetes’ yielded 140 articles. The keywords ‘school nurse’ and ‘asthma’ yielded 180 articles. Additional searches used combinations of the terms using ‘school nurse’ with conditions such as ‘obesity’, ‘violence’, and ‘behavior’. Two articles were selected from a reference list using an ancestry search.

Inclusion and exclusion criteria were created to select the most relevant articles for the review of literature. The articles must have been published within the past nine years and have significance to the PICO question. Key words such as “school nurse” and “outcomes” brought back many general articles therefore it was important to review and select articles that related specifically to the topic. Articles selected examined interventions school nurses performed as well as the school’s assessment of the school nurse’s role in caring for students. Twenty articles were selected for the review of literature.

### **Review of Literature**

The literature reviewed supports the premise that nurses positively influence students and are an important member of the school team. Variables examined included the nurse’s role in interventions directed at chronic diseases, such as asthma (Garwick, Svavarsdóttir, Seppel, Looman, Anderson, & Örlygsdótti, 2015; Liberatos, Leone, Craig, Frei, Fuentes & Harris, 2013; Rodriguez, Rivera, Perlroth, Becker, Wang & Landau, 2013; Medaglia, Knorr, Condon & Charleston, 2013; Engelke, Swanson & Guttu, 2014; Kintner, Cook, Allen, Meeder, Bumpus, Lewis, 2012) diabetes (Damgaard and Young, 2014 & West and Holmes, 2014) mental health

(Ramos, Greenberg, Sapien, Bauer-Creegan, Hine, & Geary, 2013; Khubchandani, Telljohann, Price, Dake & Hendershot, 2013; Vernberg, Nelson, Fonagy & Twemlow, 2011) and obesity (Pbert, Druker, Gapinski, Gellar, Magner, Reed, Schneider, Osganian, 2013; Quelly, 2014; Golslater, Fast, Bergman-Lind & Enskar, 2015; Morrison-Sandberg, Kubik & Johnson, 2011; Tucker and Lanningham-Foster, 2015). Studies also examined the school nursing staff's role in health screenings (Kemper, Helfrich, Talbot & Patel, 2012).

### **Asthma**

Asthma is the most common chronic illness in children and has been studied extensively within the school setting. In a descriptive international study (schools in Minnesota and Iceland) conducted by Garwick, Svavarsdóttir, Seppel, Looman, Anderson, & Örlygsdótti, (2015) many barriers were identified that create difficulties for managing asthma within the school setting. These barriers include, but are not limited to, lack of communication with student's family, lack of healthcare coverage, low socioeconomic status, and poor documentation of illness by the school system. The purpose of this study was to identify and compare how nurses in Iceland and Minnesota care for children with asthma. The study included a total sample size of 32 nurses, 17 nurses from Reykjavik, Iceland and 15 from St. Paul, Minnesota. Focus groups were conducted (three in Iceland and three in Minnesota) with 5-6 participants. Focus groups lasted 60-90 minutes. The following four questions were asked to elicit data about asthma care: What are your role responsibilities in working with children with asthma in your school? How do you coordinate care with parents of children with asthma? How do you coordinate care with the child's healthcare providers? How do you engage school personnel in preventing asthma episodes? Results found that nurses in Minnesota and Iceland use similar components of the asthma care coordination model. The components used include information gathering, assessing

risk for asthma episodes, prioritizing healthcare needs, and anticipating and planning for student needs. Nurses from both countries reported providing asthma education, communicating with parents and other staff, and managing symptoms. Results found that nurses in Iceland and Minnesota have established an asthma care coordination process. Results showed that the nurses in both countries are experienced in treating an asthma attack and are effective in collaborating with parents, healthcare providers, and school staff. Participants stated that during an asthma attack they identify the trigger, call for help, refer to the student's asthma action plan, assess and reassess the student, and administer medications. The focus groups supported the nurses' preparedness and interventions when treating acute asthma attacks.

Liberatos, Leone, Craig, Frei, Fuentes & Harris (2013) completed a study focusing on school nurses interacting with elementary school students with high hospitalization rates from asthma in New York school districts (2013). This descriptive study focused on the concept that within schools the nurse is extremely important in responding to asthma attacks and implementing an asthma management. The purpose of this study was to identify barriers to asthma management by school nurses. Asthma hospitalization rates for school districts were collected before the study. As a result, this data reported which school districts had the highest asthma hospitalization rates and which school districts were at the highest risk for asthma hospitalization. A telephone interview was then scheduled with the school nurse after the survey had been filled out. Surveys were sent to school nurses in 44 schools to describe the management of asthma in the school setting. Out of the 44 schools interviewed, over 80% of school nurses from the 44 schools stated they had a school wide asthma emergency plan for all students. These same nurses also stated that poor communication with parents and lack of supplies were common issues. In conclusion, the study found that asthma management in low income areas is difficult.



The study found that the three main groups responsible for managing elementary student's asthma are the parents, school nurse, and health care providers. The school nurse often reported frustration in working with the other two groups and a lack of communication between the healthcare provider and parents. The study concluded that while school nurses are working to provide asthma management to children it is a difficult job. Outcomes in students with asthma may be improved with increased communication between parents, nursing staff, and healthcare providers. Recommendations included accessible education materials for all as well as increased education for parents regarding asthma and asthma management.

Rodriguez, Rivera, Perlroth, Becker, Wang & Landau (2013), examined nurses' roles in asthma management and student absenteeism in school grades K-8. In a quasi-experimental design, four schools with full-time nurses (demonstration schools) were compared with five schools with part-time nurses (control schools). Student data including school attendance and health measures was analyzed before and after the project. From 2006-2007 all schools had part-time nurses with a nurse to student ratio of 1 to 2055. By the 2008-2009 school year, there was a nurse to student ratio of 1 to 719 and full-time nurses were placed in four schools. A logistic analysis regression was performed to compare the difference in the number of school absences due to illness between schools with full time nurses and schools with part-time nurses. Results found that from 2006-2007 to 2008-2009 there was a decrease in the mean number of absences due to illness among schools in demonstration schools, the schools with full time nursing staff. The mean number of absences increased in the control schools, the schools with part-time nursing staff. Students in demonstration schools missed an average of 0.48 days (per student) less than students in comparison schools. In addition, students in demonstration schools missed an average of 3.05 days in 2006-2007 compared to 2.85 days in 2008-2009. Students in control

schools missed 3.09 days in the 2006-2007 and 3.23 days in 2008-2009. The intervention of full-time nursing staff decreased the number of missed school days due to an illness. The findings suggested that employing full-time nursing staff in schools not only decreased the number of absences due to illnesses but improved asthma management through education and monitoring of the disease.

Medaglia, Knorr, Condon & Charleston (2013) investigated asthma management in Massachusetts schools grades K-8. The purpose of the study was to evaluate a comprehensive statewide school-based asthma surveillance program and examine 5 years (2005-2009) of surveillance data. This purpose was based on the problem that specific information regarding who is diagnosed with asthma in communities and school districts is not always complete and accurate. Therefore, the study aimed to create a state program which provides more accurate data. A 1 page survey was sent to every public, private, and charter school in the state and all schools participated. About 2000 schools participated for each year. School nurses at each school annually reported the number of students whose school health records showed a diagnosis of asthma. School staff was then asked to send back the survey. Surveys were reviewed for any missing information and callbacks were made if necessary. Results found that participation increased every year and after the third year of data it was found that asthma prevalence for 50% of communities fell within the statewide prevalence range. In addition, 26% of communities fell below and 24% above. Therefore research showed that a school-based asthma surveillance system can be created. Limitations include that this may not be applicable to other states as Massachusetts has supportive school based regulations allowing examination of school health records. However, this system could assist the nurse manage students diagnosed with asthma and

could potentially be used to examine other chronic health conditions. The study demonstrated improved awareness of those students diagnosed with asthma.

Engelke, Swanson & Guttu (2014) examined school nurse case management for students with asthma including the development of goals and interventions. Data was collected during the 2009-2010 and 2010-2011 school years. The sample included 143 students from grades 1-12. The school nurse conducted an initial assessment as well as obtained grades from the previous year and assisted the student in completing a baseline measure of quality of life. The nurse chose overall direct care goals for all students which were divided into 6 categories (safe school environment; symptom management; self-care; academic success; family/peer relationships, and health care coordination). There were also goals specifically targeted for asthma. The nurse then provided interventions which were divided into 5 categories (direct care; student education/counseling; parent/family education; teacher/staff education; and health care coordination). Interventions for asthma care were also available. Regarding measures, the nurse identified whether the goal was met, partially met or unmet. The school nurse also documented the interventions given for each student. The interventions found most used included assessing vital signs, managing symptoms, supervising inhalation medications, and education about asthma. Results found that school nurses sought to establish a safe school environment first and foremost. This was done by developing emergency action plans, ensuring that supplies and orders were available at school, and teaching school personnel about asthma (signs and symptoms of asthma exacerbation) so that could respond to any potential emergent situation. The study found that nursing interventions were successful. Goals of case management for students with asthma included decreasing the number of health related absences, reduce emergency department visits/hospitalizations, improving academic success, and more. Results indicated that 58% of

students met the goal to decrease the number of health related absences. In addition, 69% of students met the following goal: reduce emergency department visits/hospitalizations and 60% met the following goal: improve academic success.

Kintner, Cook, Allen, Meeder, Bumpus & Lewis (2012) evaluated the feasibility of an asthma program and the benefits that older school age students receive from partaking in this program. The asthma program was created by community professionals, school personnel, and healthcare professionals. The sample was 28 6<sup>th</sup> and 7<sup>th</sup> grade students. Students were eligible to participate if they were diagnosed with asthma, had verbal or written consent from parents, and could attend all class sessions. The program consisted of a school component which required meeting for 10 weeks, once a week for a 50 minute session where students were asked to draw expressions of what it is like to live with asthma and write stories about their experiences. The community component was directed towards the students' family and social networks. The family participated in a 3 hour long information session about asthma. A survey was then given to students and caregivers. They were asked to self-report their satisfaction with the program. The investigators found that both students and their families were willing to participate in this program/intervention. All sixth grade students attended the sessions and 66% of seventh grade students attended. In addition, 67.9% of caregivers attended the community program and 100% of those who attended stated they strongly agreed they learned something new in the information session. All students appreciated the program and 95% stated they learned something new about asthma. The study showed positive feedback regarding the program offered at the school and in the communities. The willingness of the students and caregivers and the flexibility with times when working with the caregivers in the community assisted in the success of this intervention.

The study demonstrated that such interventions created by health care professionals and carried out by nurses can successfully educate both students and families with asthma.

### **Diabetes**

Diabetes was a focus of multiple studies. Damgaard and Young (2014) analyzed the safety and effectiveness of a model of care that linked trained unlicensed assistive personnel (UAP) to registered nurses (RNs) via telehealth technology in central, northeast, and southeast regions of South Dakota. A UAP is a professional who assists people with activities of daily living under the supervision of a registered nurse, licensed practical nurse, or health professional. A sample size of 31 students was used, 20 males and 11 females. Six registered nurses who were certified diabetes educators participated in the study. The nurses provided the unlicensed personnel with training on insulin administration and education regarding diabetes. Each student had an individualized diabetes medical management plan which the nurse followed when delegating tasks to the UAP. Diabetes care tasks performed by the UAP included insulin administration, blood glucose monitoring, carbohydrate counting, activity monitoring, hypoglycemic and hyperglycemic recognition and treatment, and emergency glucagon administration. The nurses reviewed the weekly clinical interventions performed by the UAPs and monitored them for safety. Trained unlicensed personnel administered 5,569 doses of insulin subcutaneously to children enrolled in the project with only one medication error recorded. The unlicensed personnel recorded 708 episodes of hypoglycemia. Of those episodes, 703 (99%) were treated appropriately. This study demonstrated that registered nurses can safely delegate and supervise insulin administration to UAP. Through the supervision of a registered nurse, the unlicensed assistive personnel managed the students' episodes of hypoglycemia, hyperglycemia, and administered insulin.

West and Holmes (2014) evaluated the school nurse's role in the care and management of students with diabetes. A survey was created and placed online through the National Association of School Nurses (NASN) website. All members of NASN were encouraged to complete the survey. The survey was completed by 604 school nurses throughout United States. The survey was comprised of 37 5-point Likert scale items (A=do not agree to E=strongly agree). Survey questions were aimed towards the nurse's comfort level with their role in managing diabetes in the school system. Results found that 93% of school nurses strongly agreed that students have blood glucose monitoring equipment however 31% of school nurses strongly agreed that students are not competent with the medical equipment. Results showed that 42.5% of school nurses had less than three students with diabetes and 43.5% reported having 6-8 students with diabetes. The study did not address the nurses' interventions or how the nurses' employed in school systems affect student's with diabetes outcomes. The study focused on the nurses' perceptions of student's with diabetes and the need for increased education about blood glucose management and weight management plans for those students diagnosed with Type II diabetes.

### **General School Based Nursing**

Weismuller, Grasska, Alexander, White & Kramer, (2007) explored elementary school nurse interventions. A sample of 240 health records were collected from three elementary schools grades kindergarten through fifth. Health records selected and reviewed were from the 2004-2005 school year. Data included demographics, reason for referral to the school nurse, school nurse interventions required, and student outcomes. The Schools Administrative Student Information system (SASI) documented numbers, dates, and reasons for student absence. High student absence was defined as the student missing 11 school days or more. The authors reported the most common reason for school nurse referral was screenings (vision, hearing, and dental).

Of the 240 students, 102 students received more than one intervention including screenings. The findings also showed that 51 additional students received more than one intervention, not including screenings. The authors found that the school nurse was involved with 75% of high absence children and 66% of low absence children. Students with health concerns identified at the beginning of the year received more nursing interventions than those with high absences. It was found that nurse interventions for students were targeted towards management of the student's condition not specifically at absenteeism. Outcomes showed that there was no relationship between school nurse intervention and student absenteeism.

Bonaiuto (2007) examined school nurse case management and its impact on attendance, behavior, academic performance, quality of life, and health compliance. The study posed the question, "Did this student show improvement in any of the following categories: attendance, behavior, academic performance, health or health compliance, and quality of life as reported by the student or an adult working with the student?" The study population was families with low incomes and lack of medical care. The goal of this project was to reduce health related barriers to learning and was completed over a four year time span. Data was collected through health records of students who received school nurse case management. Nurses submitted data regarding the interventions, whether they were successful, and outcomes. Nursing interventions included services that included components of case management. A total of 240 students were managed (school year 2002-2003) by 55 nurses in year one. In year four (school year 2005-2006) a total of 1,625 students were managed by 73 nurses. Student grade level in each year ranged from pre-K to twelve. In year one the investigators reported improved attendance (34% of students), improved behavior (27% of students), improved academic performance (29%), improved quality of life (59%), improved health/health compliance (63%) and improved in one

or more areas (92%). However, 12% of students had worse attendance. Bonaiuto and colleagues explain this phenomenon as expected due to the multiple stressors experienced by students in this population, including neglect and poverty. Outcomes showed that nursing interventions improved student attendance, behavior, academic performance, quality of life, and health.

Baisch, Lundeen & Murphy (2011) reviewed the importance of the role of school nurses. The purpose of the study was to provide evidence that school nurses positively influence student health concerns. Surveys were used to collect data and provided to principals, assistant principals, clerical staff, and teaching staff from the high schools, middle schools, and elementary schools. The sample size was a sample of 565 teachers, 24 principals or assistant principals, and 45 office clerical staff. Data was also collected from de-identified health records of elementary school students in 11 program schools with nurses (n = 9346) compared with the de-identified health records of elementary school students from matched control elementary schools (n = 7249). Program schools are schools receiving Federal Title I funding to provide a baccalaureate-prepared registered nurse to students. Results found that school staff was satisfied with having a school nurse available. The satisfaction scores for nurses on a scale of 4 (strongly agree) to 1 (strongly disagree) were as follows: 3.69 for principals, 3.58 for teachers, and 3.45 for clerical staff. Time was also considered. Principals and assistant principals reported a decrease of 57 minutes spent dealing with student's health care issues while clerical staff reported a decrease of 46 minutes. Teachers reported a decrease of 20 minutes. In addition, schools with school nurses had higher immunization rates. A cost analysis also showed a reduction in expenditures in schools utilizing nurses. These studies support the idea that a school nurses benefits a school system and the students.



**Mental Health**

Ramos, Greenberg, Sapien, Bauer-Creegan, Hine & Geary (2013) examined the school nurse's role in managing behavior health emergencies. Ramos et al. surveyed three hundred and sixty nurses asking for their response to how they manage behavioral emergencies in school. The 41 item survey asked the question: "For a student during the last school year, for the following health reasons, did you provide emergency management?" in order to measure emergency management. Emergency management was defined as actions taken in the school setting to treat a medical problem or emergency. This could include an asthma exacerbation or a student experiencing suicidal ideation. Activation of emergency medical services was measured by the question: "For a student during the last school year, for the following health reasons, did you activate emergency medical services (EMS)?" Results showed that two thirds of the nurses responded to the survey stating that they had provided behavioral emergency management at least once in the school setting. Behavioral emergency management included addressing child abuse, neglect, depression, and violence at school. Half of the respondents reported providing emergency management for bullying and over 40% reported providing emergency management for a suicidal student. Over 15.3% of respondents reported activating EMS for substance abuse and 12.5% reported activation of EMS for suicidal ideation. This research highlighted the likelihood of a school nurse having to perform emergency practices. Respondents also identified the need for further education on topics such as suicide, depression, substance abuse, and violence at school. The research concluded that nurses do perform emergency management for students with health issues such as substance abuse, depression, suicide, and violence.

Khubchandani, Telljohann, Price, Dake & Hendershot (2013), evaluated the school nurse's role in providing interventions to victims of adolescent dating violence (ADV). The

purpose of this study was to assess the perceptions and practices of school nurses regarding adolescent dating violence. A four page, seventeen item survey was used to assess the school nurses' perceptions and practices. The survey asked the nurses to rate their responses to questions on a Likert scale (strongly agree to strongly disagree). The survey was emailed to 750 high school nurses and 404 responded with a completed survey. The nurses surveyed reported an average score of 2.65 on a scale from 1 (no problem with ADV) to 5 (major problem) for their school. Results found that 54.2% of the respondents reported that their schools educated students on dating violence education, 66.3% reported that their schools educated students on health dating relationships and 50.5% reported that their schools educated students on where to report dating violence. About 21.8% of nurses reported that their school's violence prevention/safe school policy addressed ADV and 34.4% of nurses reported that their school had information about ADV that was easy for students to access. However, 79.5% of school nurses reported that they did not have a school protocol or procedure to respond to an incident of ADV. The survey also asked questions regarding the school nurse's job in preventing and responding to ADV. Eighty seven percent of nurses believed they had a major role in preventing and responding to ADV. It was also found that 53% of nurses had assisted victims of ADV in the past two years. The study demonstrated the need for improved a protocol or procedure for responding to ADV. The study also showed that over half of the nurses surveyed reported assisting victims of ADV within the past two years, emphasizing the extent of the problem.

Vernberg, Nelson, Fonagy & Twemlow (2011) analyzed complaints from students regarding victimization or aggression in a Midwestern city. Victimization complaints were recorded onto logs by the school nurses and aggression was assessed using a survey filled out by students. Nursing logs recorded the student's name, date of the visit, reason for the visit, and

action taken by the nurse. Numbers were used based on the reason for the visit. The following numbers were assigned: (1) no code (given for routine visits); (2) somatic complaint; (3) illness; or (4) injury. Victimization was assessed using a self-report which included 10 items sampling forms of victimization. Students used a 5-point Likert scale (never, once or twice, a few times, about once a week, and a few time a week) to report how the items applied to them over the past 3 months. Aggression was assessed using a peer nomination procedure. Students were provided with a list of classmates and were asked to circle names of classmates who fit the behavior described in each of the questions. The sample size used was 590 children grades 3 through 5. Results indicated that victimization and aggression were frequent health concerns reported by students and that further research suggests identifying and treating the problem early and initiating prevention interventions. According to data the reason for visiting the nurse most was injury with a mean number of visits of 2.78 and somatic complaint with a mean number of visits of 2.5. These visits to the nurse were made by 3<sup>rd</sup> graders. Injury refers to falls, being pushed, being hit, and requesting a Band-Aid. Somatic complaint refers to stomachache or headache with no fever or vomiting. The older the grade the less likely the student was to visit the school nurse. In addition, females were more likely to visit the school nurse with a mean number of 2.51 visits compared to 1.73 visits for males. Victimization reports were found most commonly in third graders followed by fifth graders and then fourth graders. The study concluded that involvement in aggressor-victim interactions whether the victim or aggressor, is related to increased complaints to the school nurse whether the complaint is an illness, injury, or somatic complaint. Further need for education and involvement in screening for aggression and victimization is needed since victimization and aggression have negative impacts on children's health. Nurses

deal with aggression and victimization frequently; however, further interventions and education are needed to prevent aggression and victimization.

### **Obesity/Physical Activity**

Pbert, Druker, Gapinski, Gellar, Magner, Reed, Schneider, Osganian (2013) examined the school program “Lookin’ Good Feelin’ Good”. This program consisted of 6 one-on-one counseling sessions conducted over 2 months during the school day during non-academic classes in the privacy of the school nurse office in a Massachusetts school. The purpose was to help students deal with obesity in new ways, while promoting positive self esteem. This cluster randomized study had a sample size of 82 high school students with a BMI>85% for age and gender. The intervention group received the program “Lookin’ Good Feelin’ Good’ while the control group received 6 one on one visits with the school nurse over two months that did not include the program. Instead the students were weighed, read informational pamphlets and discussed behaviors. This intervention was conducted to determine the school nurse’s role in implementing obesity interventions and proved to be beneficial. Results found that students in the intervention group showed reductions in blood pressure and waist circumference at 2 and 6 months. The intervention group on average consumed a lower amount of total sugar at 2 months but was not maintained at 6 months. Students in the intervention group were more likely to drink soda less than one time/day and eat at fast food restaurants less than one time/week, and ate breakfast more days a week. Fat intake and caloric intake did not change. In conclusion, the intervention produced positive changes. Nurses reported that a many of the students attended 1 or more visits whether in the intervention or control group. All nurses found that the intervention was not hard to incorporate and didn’t take up much time throughout the day. In addition, 75% of nurses reported they felt the intervention (“Lookin Good Feelin’ Good”) and the control

group's school nurse session were beneficial for all students and that the students were very receptive. The study showed the benefits of the school nurse led intervention in helping students with obesity.

Quelly (2014) used a correlational design to evaluate the effects of benefits, barriers, and self-efficacy on school nurses childhood obesity prevention (COP) practices. A sample of 171 nurses was surveyed in Florida schools regarding childhood obesity prevention practices. Inclusion criteria were being a registered nurse who was currently employed in Florida and had been employed during the 2010-2011 school year. The nurses were provided a 70 item survey which included demographic information, childhood obesity prevention practices, and perception scales measuring self-efficacy, perceived barriers, and perceived benefits. Sixty of 171 participants completed the survey. School nurses performed overall childhood obesity prevention practices but there was significant variability between practices. For example, most nurses reported not contacting a parent about a child's weight concern or assessing the nutrient quality of foods served at the school while other did not initiate this contact. Many nurses also recommended that a parent contact a health care provider for a child-related weight concern. In conclusion, it was found that reasons for differences in childhood obesity prevention practices were due to the nurse's level of self-efficacy. The level of self-efficacy depended on the nurse's level of education and experience. It was also found that perceived barriers such as time and lack of resources accounted for a decrease in COP practices and perceived benefits accounted for an increase in self-efficacy and as a result COP practices. In order to increase childhood obesity prevention practices it is recommended that additional education and training be offered. The study showed that while more training and education are needed, most nursing staff in Florida is carrying out childhood obesity prevention practices.

Golslater, Fast, Bergman-Lind & Enskar (2015) examined the school nurse's impact on physical activity in students. This study aimed to explore school nurses' dialogue with students regarding physical activity. A sample size of 15 female nurses was used. With the exception of one, these nurses had special training in pediatrics, school or primary health nursing and had experience working as a school nurse for one to 15 years. The nurses carried out 24 health visits with eight students in each of the following age groups: 10, 14, and 16 years. The study used inductive qualitative content analysis for the design and had a researcher present during all health visits to record the school nurse and student's interaction. The health visits lasted anywhere from 22 minutes to an hour and 17 minutes. Written consent was obtained from the children, parents, and nurses before data collection began. Results were presented in the following four categories: Enabling the progress of the dialogue, creating a relationship, assessing information on physical activities, and creating potential for change in physical activities. Under the category enabling the progress of the dialogue, the nurse encouraged the student to talk about physical activity. The nurse supported the student's participation in activities and the nurse referred to the student's written answers regarding physical activity on the paper to make sure he or she understood correctly what the student was saying. Under the category creating a relationship, the nurse gained the student's trust and encouraged physical and sedentary activities. Under the category assessing information on physical activities, the nurse identified the student's interests and habits regarding physical activity. Under the category creating a potential for change in physical activity, the nurse made the student aware of unhealthy habits. The nurse also provided information on physical activity and formulated exercise plans. The study found that the school nurse can create a picture of the student's physical activity and focus on each individual to encourage optimal well-being for the student.

Morrison-Sandberg, Kubik & Johnson (2011) reviewed current obesity intervention practices led by school nurses in Minnesota elementary schools. Interviews were conducted with 21 licensed school nurses that lasted between 45 and 90 minutes. The interview questions were open ended and included questions regarding primary and secondary prevention, school-based collaboration, weight-related teasing, and community-based collaboration. A section regarding opinions about school-based, nurse-led obesity prevention programs was also included. The interviews were taped and then transcribed by two trained researchers. Results showed that 17 of the 21 participants (80%) identified obesity as a major concern in their school system. All nurses stated that they were active on the wellness councils in the community and 90% of the participants stated secondary prevention practices (height, weight, blood pressure monitoring) were being provided to students. Two thirds of participants stated that obesity prevention efforts were insufficient and half stated they would like to implement more prevention practices. In addition, while 80% of nurses stated that obesity was a major problem, 76% identified chronic health conditions as the main priority in the school system. School nurses stated that time, workload, and staffing were barriers to obesity intervention practices. Implications for the study included the need for the school nurse to begin working with other school personnel and community officials for more obesity prevention care. The study revealed that many nurses offer secondary prevention practices (90%) and would like to implement more obesity prevention practices.

Tucker and Lanningham-Foster (2015) investigated school nurse led obesity prevention practices. The purpose of the study was to examine the effects of a childhood obesity prevention intervention. The sample size was seventy-two children, fifty from elementary school A and twenty-two from elementary school B. Nursing students from a local nursing school were also

included in the study. Forty-five nursing students from nursing program A mentored students at school A and twenty-four nursing students from nursing program B mentored students at school B. Each nursing student was assigned to 1-3 students. For the study, baseline and end of year data was collected on BMI percentile, healthy habits and physical activity. Physical activity was measured using a StepWatch Activity Monitor which the child wore for 5-7 days. Height and weight were measured using a scale and stadiometer. BMI percentiles were calculated using the Centers for Disease Control and Prevention's growth chart. A healthy habits survey was completed by students. This survey contained 10 items and addressed nutrition, screen time, physical activity, and family eating patterns. The intervention provided was titled the Let's Go 5-2-1-0 program. It was delivered in the classroom by the school nurse and nursing students. The nurse and nursing student met with their assigned students for 10-15 min each once a week during lunch. During this meeting, the nurse and nursing student would set goals with the student. They would then discuss ways to achieve these goals. Depending on the school and other circumstances (holidays, student absences) each student attended 14 to 21 sessions. Results showed that in school A the number of servings of fruits and vegetables per day increased from baseline to end of year and the number of servings of 100% fruit juice per day decreased. At school B, self-reported servings of fruits and vegetables per day increased from baseline to end of year and objectively measured participant physical activity levels increased. There was no significant difference between school A and school B. Students at both schools improved their physical activity and intake of fruits and vegetables. School nurses are in an optimal position to provide obesity prevention interventions. The study showed that the nurse led intervention results in better health practices among the elementary school students.



## Screenings

Kemper, Helfrich, Talbot & Patel (2012) evaluated the impact of school nurses' vision screening programs in the North Carolina school system. Data used was selected from a sample size of 10 elementary school using only first, third, and fifth grade students during the 2009-2010 school year. An incentive was provided to the parents of the students if the parents brought back paperwork showing the child went to a follow-up eye examination appointment. An incentive was also provided to the nursing staff in exchange for data collection. Results showed that of the 2,726 children who were screened, 7.7% (n=209) had abnormal screening results. Of these 209 student with an abnormal screening, 89% (n=186) were placed into a comprehensive database for follow-up. No documentation of any follow-up was available for 35% (n=65) of these children. Of the 106 with complete eye examination data available, 54.7% (n=58) had myopia, 22.6% (n=24) had hyperopia, 11.3% (n=12) had astigmatism, and 1.9% (n =2) had anisometropia. These are examples of eye conditions referred to as refractive error. Refractive error is defined as an error in the focusing of light by the eye. Of the 106 students receiving a complete eye examination, 9.4% (n =10) were normal, indicating a low false positive rate. Two thirds of the students who had an abnormal vision screening had a follow up within six months. The study showed the importance of school nurse vision screenings and identification of refractive error. The students with abnormal results were able to follow up with an eye doctor and potentially receive corrective lenses for their specific problem. The school nursing staff plays a crucial role in performing screenings and identifying refractive error.

## Conclusion

While the literature presented numerous studies examining interventions performed by nurses for obesity prevention (Quelly, 2014 & Pbert et al., 2013), diabetes management (West &

Homes, 2014, Damagaard & Young 2014), asthma control (Liberatos et al 2013, & Garwick et al 2015), and behavioral emergencies such as abuse, depression (Ramos et al.,2013), and adolescent dating violence (Khubchandani, et al., 2013), none of the studies compared outcomes of adolescents in school settings with interventions delivered by licensed practical nurses compared to registered nurses. There was also a preponderance of studies focusing on conditions such as asthma, obesity, and diabetes with few studies targeting violence and behavioral issues. Many of the studies were self report surveys of nurses on the presence or absence of performed interventions rather than describing the interventions. Rodriquez et al. (2013), Weismuller et al. (2007) & Bonaiuto (2007) looked at student based outcomes such as absences at school while other studies were deficient in this area.

### **Critical Appraisal of the Evidence**

The prevalence and importance of chronic illness and the need for both preventive and interventional strategies to optimize in school health and related outcomes is clear. The evidence presented provided a valuable insight into the interactions between an individual acting as the school based nurse, and the student. However, the evidence does present limitations, including that of small sample sizes and/or narrow populations. The research provided by Damgaard and Young (2014), Garwick et al (2015), and Libertos et al (2013) all drew their data from sample sizes smaller than 50 individuals. Likewise, some researchers were able to find a large portion of participants, but acquired them from a narrow and specific population. For example, the research collected by Pbert et al (2013) came from a larger sample size, but was only collected from six public schools all in a similar area of Massachusetts. Likewise, Vernberg et al (2011) had an extremely large sample size (590 participants), but this population solely consisted of 3<sup>rd</sup>

through 5<sup>th</sup> graders. This limits the findings to a small portion of students that interact with an individual who could provide school based nursing.

While collecting entries to include in this literature review, the researchers found an additional limitation to the study. The articles and research used in this study all were obtained from one database, CINAHL. While this database proved to be extremely useful and reliable, there is a possible limit placed on the articles that can be reached. For future searches and expansions on this topic, the research team suggests creating larger inclusion criteria that would include a set number of years, as well as more databases. This would aim to include more articles from journals that aren't solely focused within the nursing and allied health field.

Another glaring limitation of the evidence available was the lack of consistency in regards to level of nursing education and licensure providing the school based nursing interventions. Given the different individuals of varying licensures and degrees of education providing interventions, conclusions based on professional backgrounds are impossible to be drawn with the current available evidence. The individuals providing school based nursing care ranged from unlicensed personnel, licensed practical nurses, nursing assistants, and registered nurses. Although interventions could be implemented by any of these individuals, very few studies addressed the relationship between level of training and outcomes. Damgaard et al (2014) was the only article used that compared two different types of professionals; unlicensed personnel and registered nurses. Quelly et al (2014) did discuss the impact registered nurses had on individuals; however, there was no comparison to another group. Furthermore, the majority of evidence found simply used the term "school nurse" without clarifying the level of training.

A variety of methodological approaches were found. A majority of the studies were descriptive, utilizing surveys and interviewing tools. Of the studies presented in this review,

eight utilized a form of survey, while five used descriptive approaches. The surveys mainly employed a closed-ended system, with a majority relying on a likert-type scale to reduce error and variability. Any surveys that were completed incorrectly were not used in these studies. The National Association of School Nurses (NASN) was utilized by multiple studies to help develop and launch their surveys, taking advantage of the membership to reach out to the largest organized group of school nurses (Khubchandani et al (2013) and West et al (2014). By working with the NASN and administration of the schools, the validity of the surveys increased substantially.

In addition to survey methodology, interviews were also employed, providing both quantitative and qualitative data. Garwick et al (2015) employed a focus group to allow the school nurses to share their experiences as they acted as the primary source for nursing care at their individual schools. Baisch et al (2011) utilized a survey as well as had access to health records. Using these more descriptive measures increased reliability of the answers collected from the primary sources.

### **State of the Science**

. The purpose of this systematic literature review was to explore the effects of school based nursing interventions on student outcomes. Some chronic illnesses and situations were more heavily focused than others, leaving further opportunities for research. For example, diabetes and obesity have a large group of information, while self-image perception and health screenings have had a lesser focus. Exploring more areas that affect school age students, and the interactions the school based nurse has with them, is an opportunity for more research.

Most apparent, however, is the lack of studies that compare levels of education and certification between the selected caregivers within schools. A majority of the current literature

simply discusses an individual deemed the school nurse. The current science supports the theory that having a designated individual as a school nurse improves many outcomes for students. An opportunity thus arises to explore if there are relationship between the educational preparation and licensure of the nursing care provider and student outcomes, including unlicensed personnel, licensed practical nurses, nursing assistants, and registered nurses.

### **Conclusion**

The goal of this literature review was to conduct a review of the literature examining the disposition outcomes of children seen by school nursing staff. The research question asked, “How does school based nursing practice provided by a designated individual affect outcomes in children at school clinics?” The evidence available focused on various causes that would create an interaction between a student and the individual providing school based nursing. These causes varied from diabetes maintenance, other chronic illnesses, to health screenings.

The review of the literature explored three concepts. The first concept that is supported is that school age children, ranging from K-12, face many issues that can negatively affect their school performance. The second concept that the evidence utilized in this review supports is that the outcome of a student dealing with a health related issue (whether it be a chronic disease, social situation, or other) was greatly improved by interacting with an individual providing school based nursing. The second concept that is supported is that school age children, ranging from K-12, face many issues that can negatively affect their school performance. Finally, the current available evidence focusing on this issue does not show a large body of evidence that compares the education and certification of the individuals providing the school based nursing. With the support of this literature review, the body of evidence suggests that it is imperative for schools to employ and individual to provide school based nursing. Acting as a primary care

provider to students within a school, a school nurse can improve the outcomes of students suffering from chronic diseases and other ailments that are often seen in the school setting. This is so crucial because the list of ailments and difficulties school aged children are facing is extremely vast, and could be growing. Further research is needed to assess whether the education and licensure of the nursing care provider has an impact on school health related outcomes.

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