School-Based Telemedicine to Improve Healthcare Access for Rural School-Aged Children

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Executive Summary
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Children living in rural communities often experience disparity in access to healthcare services. The purpose of this project was to explore a school-based telemedicine plan to improve access to comprehensive healthcare services for school-aged children that live in the rural community of Coeur d' Alene (CDA), Idaho. The objectives of this project were to: (1) determine essential components of the proposed school-based telemedicine program; (2) involve community partners and other stakeholders in project planning; and (3) disseminate the development plan and results of the needs assessment at a larger community stakeholder's presentation and at the School Nurse Organization of Idaho (SNOI) annual conference.

School-based health centers (SBHCs) have been shown to increase children's access to preventative care visits, improve screening rates for high-risk behaviors, provide a linkage between the health and education systems, provide an entry point and source of primary care connecting students to a medical home, and contribute to positive educational outcomes. By using electronic information and telecommunications technology, SBHCs deliver long-distance, clinical healthcare, counseling, and health-related education for students, school staff and others in the community.

Following Institutional Review Board approval, a community needs assessment for the SBHC was distributed via electronic surveys to parents, students, and school staff. Focus groups and interviews with identified key stakeholders and community partners were held. The results of the needs assessment were presented to key school district administrators. Due to unforeseen stakeholder opposition, a greater community forum for discussion of the project's findings was not possible. Project findings will be presented on June 9 and 10 at the 2014 Annual School Nurse of Idaho Conference.

Approval to present the needs assessment data to district board members and to continue forward with the school-based telemedicine program has not been granted and is currently under consideration by the CDA Superintendent and other key administrators. Both telemedicine and SBHCs are potentially controversial programs in Idaho, which is a conservative state and one of the last states to embrace SBHCs. Since beginning the project, two SBHCs have opened in the state of Idaho and state legislators are currently looking at existing policy regarding Medicaid coverage for telemedicine. As exposure to telemedicine and SBHCs increase, telemedicine in schools as a means to improve access to healthcare may become more accepted.

The project committee consists of Pamela Phares, PhD, APRN-BC, Project Chair; Dianne Fuller DNP, FNP-C, PCNP Program Director; and Katie ward, DNP, WHNP, ANP, Executive Director of MS and DNP Programs. Content Experts are Steve North, M.D., MPH, Family Physician and Adolescent Medicine Specialist and Medical Director for the Center for Rural Health Innovation in Bakersville, North Carolina; and Neil E. Herendeen M.D., MS, Medical Director for Health-e-Access Telemedicine program in Rochester, New York.

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Residents living in rural communities face a unique combination of issues that create disparities in access to healthcare services. On average, rural residents report fewer visits to health care providers and fewer available providers (Agency for Healthcare Research and Quality [AHRQ], 2011). Furthermore, residents living in rural areas are less likely than their urban counterparts to receive recommended preventive health services (AHRQ, 2011). Rural parents often have difficulty obtaining health services for their children because of travel distances, lack of transportation, inability to finance health care, lack of insurance, limited access to providers, lack of education, and difficulty taking time off of work (Burke, Bynum, Hall-Barrow, Ott & Albright, 2008). Frequently, rural school-aged children are from families with lower incomes who may be uninsured or underinsured and therefore, may not have a medical home or primary care provider (Allison et al., 2007). These children are more likely to endure health problems related to their lack of access to health care, or if in real need, families may use the emergency department as their primary source of ongoing medical care (Allison et al., 2007). Poor access to primary care services is associated with an increase in school absences and delays in necessary care (Allison et al., 2007). Kootenai county Idaho, home to CDA School District, is a designated health professional shortage area (HPSA) for primary care, dental, and mental health providers (Health Resources and Services Administration [HRSA], n.d.a). One solution to improve health care access in CDA School District is to implement school-based healthcare delivered via telemedicine. Telemedicine allows timely delivery of medical care and access to healthcare services that would not otherwise be available to this population (Burke et al., 2008).

Significance and Policy Implications

Poor health impacts student learning which in turn impacts both their future health status and the larger community. Learning readiness, educational attainment, and economic stability are

linked to a child's health (American Public Health Association [APHA], 2011). School-based

health centers have been shown to increase access to preventative care visits, increase screening

for high-risk behaviors, and have shown positive educational outcomes including a lower

probability of dropping out of high school (Keeton, Sloeimanpour & Brindis, 2012; Kerns et al.,

2011). High school students that don't graduate face lifelong health risks with higher medical

costs and are more likely to get involved in high risk behaviors. As adults, school dropouts are

less likely to be employed and insured, and earn less than students who graduate from high

school (APHA, 2011).

Based on the number of children living in HPSA areas and the number of uninsured

children, Idaho needs an additional 31 SBHCs to improve healthcare access for its school

children (School Based Health Alliance [SBHA], n.d.). Due to the geography and distribution of

Idaho's population, it is not possible to address the healthcare needs of Idaho's children with

traditional bricks and mortar SBHCs. The development of a school-based telemedicine network

is therefore critical (S. North, personal communication, October 8, 2013).

Goals and Objectives

The purpose of this project is to explore a school-based telemedicine plan

to improve access to comprehensive healthcare services for school-aged children living in

the rural community of CDA, Idaho. (1) Determine essential components of the proposed

school-based telemedicine program; (2) involve community partners and other

stakeholders in project planning; and (3) disseminate the development plan and results of

the needs assessment at a larger community stakeholder's presentation and at the School

Nurse Organization of Idaho (SNOI) annual conference.

Theoretical Framework

Planning and implementation of community-based health programs require building alliances and partnerships within the community. A key objective in such projects is to identify stakeholders within the targeted community who are interested in supporting a SBHC initiative delivered using a telemedicine platform.

Stakeholder theory, originally detailed in R. Edward Freeman's book, *Strategic Management: A Stakeholder Approach* (1984), suggests conducting a stakeholder analysis. The analysis explores the stakeholder's interests in order to understand relationships, prioritize stakeholders, and determine the stakeholder's knowledge level about the project. It also aids in the ability to strategically avoid misunderstandings and helps in detection of any opposition to the project (Scheid, 2011; Schiller, Winters, Hanson & Ashe, 2013). There are three major methods for identifying stakeholders. The first method is to conduct focus groups with a small number of participants to brainstorm potential stakeholders. The second method is to conduct semi-structured interviews with key stakeholders for analysis of stakeholders. Lastly, the snowball sampling method in which individuals from the initial identified stakeholders group identifies new stakeholders and contacts is used for identification of other potential stakeholders (Schiller et al., 2013). Comprehensive representation of individuals and groups who will be affected by a school-based telemedicine program is necessary to ensure its acceptance, adoption, and sustainability. Failure to garner sufficient stakeholder buy-in makes implementation of new programs difficult, if not impossible.

Literature Search Strategy

In order to investigate the most current evidence regarding SBHCs and school-based telemedicine, PubMed, CINAHL and Medline were searched using the following key terms -

school-based health centers, school-based telemedicine (SBTM), school-based telehealth, telemedicine, telehealth, and rural school-based health. All level of evidence from 1998 until now was included in the review. There was very little literature on telemedicine in school-health therefore very few articles were excluded from the review.

Literature Review

Convenient, trusted, and accessible, SBHCs are one solution to improving access to health care for rural school aged children (Gadomski, Mclaud, Lewis, & Kjolhede, 1998). As an integral part of the schools, SBHCs provide comprehensive health services for both acute and chronic health conditions in an environment where children spend most of their waking hours (Keeton et al., 2012). Using a multi-disciplinary team of providers, SBHCs offer age-appropriate services such as primary medical care, mental and behavioral health care, oral health care, nutrition education, substance abuse counseling, health education and promotion, and case management services (HRSA, n.d.b; Keeton et al., 2013; SBHA, n.d.). The care delivered by SBHCs emphasizes prevention, risk reduction and early intervention through counseling students on healthy habits and how to prevent injury, violence and other threats to their health (HRSA, n.d.b; Keeton et al., 2013; SBHA, n.d.). By providing a combination of clinical services and prevention, the SBHC model addresses many of the pediatric issues currently at the forefront of health such as obesity, asthma, dental disease, and adolescent pregnancy (Clayton, Chin, Blackburn, & Echeverria, 2010).

School-based health centers have been operating in the U.S. for more than 40 years. To date there are over 1,900 SBHCs across the country. The only states without SBHCs are Montana, Wyoming and North Dakota. Idaho just opened its first SBHC in November 2013 with

a second opened in early 2014. Fifty-four percent of these SBHCs are in urban communities, 28% in rural communities and 18% in suburban communities (Lofink et al., 2013).

Benefits of School-Based Health Centers

School-based health centers connect the education and health systems . Lost student "seat time" is reduced with the use of SBHCs, benefitting both the students, and the schools, where average daily attendance represents financial resources for the schools (Keeton et al., 2012). School based health centers support the larger school environment by providing health education in the classrooms, conducting health fairs for students, staff and parents, serving on educational committees and providing consultations to teachers and other school staff to support and address students' needs in classrooms (Keeton et al., 2012).

School-based health centers provide an entry point and source of primary care connecting students to a medical home or additional care for the child such as mental health counseling. They can serve as an extension of the child's primary provider especially when caring for children with chronic health conditions (Keeton et al., 2012). School-based health centers can provide comprehensive preventative care that is essential in establishing a medical home for all children (Clayton et al., 2010)

School Based Telemedicine

Using electronic information and telecommunications technology, SBHCs are able to deliver long-distance clinical health care, counseling, and health-related education for students, school staff and others in the community (Burke et al., 2008). School-based telemedicine may be as simple as a camera attached to a computer in the school in order to connect to a distant health care provider (The Children's Partnership, 2009). However, most SBTM programs use video conferencing equipment that has electronic otoscopes and stethoscopes and specialized cameras

to take pictures of the skin and other body parts. Teledentistry employs intraoral cameras and digital dental radiology (The Children's Partnership, 2009).

Examples of Existing School-Based Telemedicine Programs

There are approximately 40 SBTM programs in the United States effectively employing various methods to deliver comprehensive healthcare services (S. North, personal communication, October 8, 2013). In North Carolina *MY Health-e-Schools* provides telemedicine services for students in rural Mitchell and Yancey counties (MY Health-e-Schools, n.d). A centrally located health care provider examines students from 14 different schools with access to 4,000 students using technology based on high-definition videoconferencing with specially equipped stethoscopes and cameras. In 2012, as a result of *MY Health-e-Schools*, there was a 10% reduction in emergency department use by school-aged children for non-emergencies (S. North, personal communication, October 8, 2013). *Health-e-Access* in Rochester New York, has conducted more than 12,000 acute-illness telemedicine visits since 2001 (Huizenga, 2013). Triage, diagnosis and treatment of acute illness was done remotely by providers in their own offices through real-time videoconferencing and store-and-forward communication, high-resolution digital images, video clips and an electronic stethoscope (McConnochie et al., 2009). As a result of this SBTM program, Rochester preschools have experienced a 63% reduction in absences due to illness and 23% reduction in evening-hours emergency room visits (Huizenga, 2013; McConnochie et al., 2010). Through a collaborative effort, Kansas University Medical Center first implemented *TeleKidcare* in 1998, which was initially piloted in four schools, and has since expanded to include 31 schools. School nurses interact with KUMC physicians to provide consultations for sick children using interactive television, a digital otoscope and an electronic stethoscope located in the school health office (Mackert & Whitten, 2007).

There are several SBTM models that are being piloted across the state of California to address some of the specific healthcare needs of California's children (The Children's Partnership, 2009). A two-year asthma telemedicine program was piloted in three San Francisco elementary schools employing asthma experts from San Francisco General Hospital to advise students how to manage their disease symptoms more effectively. From 2007 to 2008, Children's Hospital Los Angeles partnered with three school districts in rural Tulare County in order to provide essential dental services to underserved migrant children via teledentistry. In Konocti Unified School District in Lake County, California, SBTM is being used to connect students and school staff to a pediatrician with behavioral health expertise at Open Door Community Health Centers thus increasing the ability of school nurses and staff to effectively treat children with behavioral health issues (The Children's Partnership, 2009).

Barriers to School-Based Telemedicine

Costs of opening and sustaining SBTM programs are potential barriers (Doolittle, Williams & Cook, 2003). Cost variables include participating provider and staff time. A study researching the estimated costs of a pediatric telemedicine practice in schools found that the cost of the *TeleKidcare* clinic visits and cost of visits to medical centers were identical (Doolittle et al., 2003).

One of the greatest barriers to the use of SBTM is the lack of acceptance by physicians and nurse providers (Doolittle et al., 2003). The basis of their concern is difficulty with incorporating TM into their normal daily clinical practice. Doolittle et al. (2003) suggest that SBTM is more likely to succeed if established within existing provider referral systems to eliminate potential expenses and reimbursement problems.

Billing and reimbursement problems are other barriers to consider (Keeton et al., 2012). School-based health centers serve all students regardless of ability to pay for services and as such, are challenged to maintain their sustainability (Keeton et al., 2012). Many health plans will not reimburse SBTM visits because they are not the child's primary provider. Providers have difficulty billing insurers because patients seen at these SBTM clinics are often enrolled in multiple public and private health plans. Frequently SBHCs have insufficient billing staff dedicated to pursuing payments for services provided and monitoring outstanding financial payments (Keeton et al., 2012). Non-medical visits are not billable encounters (Keeton et al., 2012). Legislation contained in the Patient Protection and Affordable Care Act will improve health outcomes for children and youth, particularly vulnerable populations, by increasing funding for SBHCs (Keeton et al., 2012).

Implementation

Objective #1

The proposal was submitted to the University of Utah Institutional Review Board (hereafter referred to as the IRB) and approval to proceed was obtained on December 16, 2013 and was effective as of December 22, 2013 (Appendix A). Surveys preapproved by IRB to assess the healthcare needs of children in the CDA school district were recreated for online distribution using Survey Monkey®. Through Skyward, the CDA district portal, cover letters serving as participants' consent and assent letters for the children containing a link to the survey were emailed to 8,624 CDA district parents, 8,239 students, and 1,732 teachers and staff on January 30, 2014. Survey results were collected over a three-week period.

Focus groups and expert interviews were conducted with key stakeholders in the CDA community and in the CDA school district from January 22, 2014 to February 20, 2014 (Table

1). Invitations were sent to community stakeholders via email. Follow-up phone calls were used as needed to confirm these meetings.

A public request was submitted by fax to Idaho Department of Health and Welfare Administrative Procedures section requesting statistics on the number of Medicaid eligible children in CDA Idaho that received their recommended well child checks last year as well as the number of non-emergent emergency department (ED) visits to CDA area hospitals.

Title I is a federally funded program in 9 of 17 CDA schools with one additional school receiving Targeted Assistance. Title 1-A schools were identified in order to ascertain which schools in the CDA district have the highest poverty, the greatest educational needs, and by extension the greatest need for improved access to healthcare services. The Idaho State Department of Education's Title 1-A website was searched for CDA school district Title 1-A eligible schools (Idaho State Department of Education, n.d.) and these results appear in Table 2.

Objective #2

Community partners and stakeholders were identified for interviews and focus groups through collaboration with the CDA school district's Coordinator of Health Services, Cindy Perry RN, BSN, NCSN and the district's Director of Special Services, Frances Huffman, on January 10, 2014. The CDA school district's Grant Director and Homeless Liaison, James Curb was approached on January 17, 2014. Other community partners and stakeholders were identified while conducting focus groups and interviews. Using snowball-sampling procedures other interested participants were recruited. A meeting was held on March 4, 2014 with key CDA School District administrators, Matthew Handelman District Superintendent and Frances Huffman, to present the results of the needs assessment and discuss how the school-based telemedicine program will meet those needs. Upon approval from the CDA school district

administrators and board of directors, a workgroup consisting of at least one representative from each stakeholder group and community partners will be formed to work on planning and implementation of the school-based telemedicine program.

Objective #3

Upon approval from CDA school district administrators and board of directors, a presentation of the needs assessment results will be scheduled for the CDA community, major stakeholders, and community partners affected by the school-based telemedicine program at the CDA school district's Midtown Meeting Hall. Personal hand delivered written invitations will be sent to key stakeholders and community partners. In addition, the presentation will be announced to a wider audience in the Coeur d' Alene Press and on Skyward. Nicole Kopping RN, School Nurses of Idaho Conference Coordinator, was contacted regarding the SNOI conference agenda and potential for presenting the results of this project.

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Evaluation

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Objective #1

Surveys, focus groups, interviews, and medical needs data were collected, collated, and analyzed by the principal investigator (PI) on by February 23, 2014 using Survey Monkey®. Response rates were 3.93% for staff and or teachers and 4.95% for parents; no students returned the surveys. The targeted return rate for surveys (30%) was not met. Eight focus groups and seven expert interviews were conducted. Title 1-A data was obtained and analyzed. Over 80% of students at Borah Elementary and Venture High School are from households rated at poverty level (Table 1). Medical need data requested from Idaho Health and Welfare was partially returned to the PI on March 25, 2014 (Appendix B). Data was returned for CDA city zip codes 83814, 83815, and 83816 only. Medicaid early and periodic screening, diagnosis and treatment

(EPSDT) visit rates last year for ages 1 to 4 years in CDA was only 1.95% and for ages 5 to 9 years was 1.47%. There were a total of 201,265 CDA children enrolled in Medicaid from October 2012 to September 2013. From those children, 3,876 (1.93%) visited the emergency department, 318 were admitted and 3,557 (1.77%) of those visits could have possibly been treated in a primary care office or urgent care instead.

Objective #2

On March 4, 2014 a formal presentation was conducted with key district administrators Matthew Handelman and Frances Huffman. Despite several emails to the CDA school district administrator, approval to present the needs assessment data to district board members was not granted but is still being considered by the CDA Superintendent and other key administrators at the time of this report.

Objective #3

The community forum was not held by March 28, 2014 due to factors beyond the PI's control. The proposed school-based telemedicine program will be presented and the poster displayed at the 2014 Annual SNOI Conference on June 9 and 10, 2014 in Nampa, Idaho.

Results and Discussion

Objective #1

Limitations that impacted the ability to conduct a more thorough and rigorous needs assessment were identified. First, the timeframe over which the project had to be completed was insufficient. Following lengthy IRB approval and necessary revisions, the needs assessment was conducted from December 22, 2013 through February 20, 2014, allowing a total of eight weeks. Time for data collection was further restricted by the CDA school district's two-week winter holiday break.

Another limitation was the wording of cover letters and surveys, which may have immediately provoked a response for or against school-based telemedicine that may have biased those respondents who had strong opinions in either direction. In addition, the surveys were only offered in English and were limited to participants that had access to email. Because no students participated in the online survey, data was not collected from this critical stakeholder data source. Limitations to the focus groups and key informant interviews included the lack of response to email invitations from a key source in the CDA district and time constraints limiting data from school secretaries.

Study results were also limited by a smaller number of responses than the originally targeted number. Parents returned a total of 427 online surveys, 68 by teachers and staff of the CDA school district, and no surveys were returned by students. The low survey return rate for parents may have been due to misinterpretation of the cover letter's wording. Several parents commented on their surveys that the letter gave the impression that a school-based telemedicine program was already being implemented in the schools. Other respondents expressed a need for additional clarification regarding school-based telemedicine in order to complete the survey. Reasons for the poor survey response from teachers and staff were not clear. Content expert Neil Herendeen M.D. suggested that a greater number of staff and teachers might have participated in the survey if administration had encouraged staff participation by sending a letter or announcement prior to its release (N. Herendeen, personal communication, March 3, 2014).

Student surveys were sent to students' Skyward emails. According to Kamy Cade, the primary contact in the school technology department for online survey distribution, students do not routinely read emails from this source and this may have accounted for the lack of student responses to the survey. Ms. Cade was instructed by the PI to send the consent cover letter and

student survey links to parent's emails, which would then link the student to the assent letter and survey however, these instructions were not followed. Steve North from *MY Health-e-Schools* Schools recommended distributing pencil-and-paper surveys when conducting a needs assessment as this may have contributed to higher response rates (S. North, personal communication, May 2, 2013).

The PI received three unanticipated personal email complaints and several strongly worded negative opinions from parents regarding the survey. Three of these pertained to the design of the survey. One participant felt that the consent cover letter looked like the school was already implementing a telemedicine program rather than a survey of the need for SBTM. Another email expressed concern that the survey did not provide an area for comments from parents. Although a section for comments was included in the survey, the parent may have overlooked it. In response to that complaint, an additional comments section was added for clarity. The third parental complaint pertained to one parent's perception that the survey was biased in its wording. This parent suggested that the question should have been worded as, *"Do you think a child's healthcare should be delivered at the school level?"* Another concern was regarding "schools becoming a catch basin for everything - including free lunches, counseling, and clothing - which is an unfortunate abuse of our children's time and our teacher's expertise." The PI addressed all complaints promptly. Two parents were contacted by email and one parent by phone. The parent participants were thanked up-front for their input. The PI then explained the intention of the study and, if requested, provided additional explanation of SBTM.

Several survey replies contained strongly worded comments about the school or government inappropriately being involved in parental matters. Comments ranged from concerns that the SBTM would involve government in their children's health to the program would be part

of Obama Care. Other comments expressed concerns that providing telemedicine would only be

enabling parents who already do not take responsibility for their children. Most of the other

negative comments from surveys expressed concerns about the telemedicine program being

supported by educational funds and that the school's primary mission is to educate, not provide

healthcare.

The IRB also received three parental participant complaints; two phone calls and one

email. According to Annie Snow, IRB Administrator, all the complaints to the IRB were

regarding the nature of the study. Following a conversation to discuss these complaints with the

DNP project chair, the IRB director, John Stillman, and Annie Snow, on January 31, 2014, the PI

submitted an Unanticipated Problems report to the IRB on February 6, 2014. Administrators

personally contacted participants by phone and addressed their concerns personally. The CDA

School District received two parental complaints, the details of which were not shared with the

PI. The complaints to the district prompted the District Superintendent (DS) to write a letter to

the District Board of Directors and to parents explaining and providing details regarding the

mass email and survey. Since these incidents, there have been no further complaints or expressed

concerns from parents.

Focus groups and interviews were conducted throughout the community with key

informants and stakeholders that provided useful insight regarding essential components of the

proposed school-based telemedicine program. Contacts established within these groups provided

the PI with opportunities to contact other key informants and stakeholders who were not initially

identified. Kootenai Health's Director of Nursing Systems, Operations and Innovation, Jan

Moseley, acted as a key facilitator in setting up meetings with Casey Meza, Executive Director

of Regional Services for Kootenai Health and Charles Andres, Regional IT Director for Kootenai

Health both of whom are heavily involved with telehealth services in the state of Idaho. These individuals were also working to obtain Medicaid reimbursement for telemedicine encounters in Idaho.

Needs Assessment Results

After analysis of all of the data health access disparities for school-aged children in the CDA school district were identified. The data was clustered based on affinity. A consolidated list of needs, access issues, essential components of a school-based telemedicine program and any opposition were presented to CDA district administrators in a needs assessment report.

The top healthcare needs of school-aged children in the CDA school district identified in the needs assessment are dental care, mental and behavioral health and or counseling, evaluation and management of attention deficit hyperactivity disorder, care for chronic illnesses, care for illnesses or injuries, physical exams and sports physicals, information and education about healthy eating and exercise, and care of children with developmental disabilities.

Poverty or socioeconomic status was identified as the primary barrier to accessing healthcare. Parents lack money for healthcare services, gas, and nutritious foods. As healthcare costs rise, parents cannot not afford the cost of insurance or high copays and deductibles. A second barrier was lack of transportation to access care. Lack of time to access healthcare services due to work commitments was a third barrier. A fourth barrier centered on a lack of parental education regarding the need for healthcare services. Lastly, the lack of parental engagement in their child's healthcare was noted as a significant barrier.

The needs assessment identified several essential components of a school-based telemedicine program for the CDA school district. Healthcare providers must be local licensed providers that parents trust. Parents want to be contacted prior to their children using school-

based telemedicine and they want to have the option to be present at the telemedicine

appointment in person, by phone or telecasted into the appointment. Confidentiality, security and

privacy (HIPPA) must be maintained. The telemedicine provider must collaborate with the

child's primary care provider regarding the healthcare visit and treatment plan. Paperwork needs

to be easy to complete and easily accessible. Telemedicine visits should be available to students

before, during and after school. Finally, money intended for educating students should not be

used for operation of a telemedicine program.

Concerns and opposition to school-based telemedicine identified in the needs assessment

included concerns regarding the costs of the program affecting the school budget. Some parents

felt that healthcare was not the purview of schools. One community pediatrician felt that access

to healthcare was not an issue in the CDA school district. He believed an SBTM program would

only encourage sick kids to stay in school or come to school sick. There were concerns that

SBTM would be impersonal and therefore unappealing. Parents also expressed concerns that the

SBTM program was associated with local and federal government intervention in their children's

healthcare. Many parents also believed that SBTM would only benefit those families who live

off the "system", thus enabling the parents who they perceive as not properly caring for their

children.

Despite the reported concerns and opposition from parents, a majority of parents, staff

and teachers were open to SBTM as a means to improve access to healthcare services for

children in the CDA school district. Over 98% of the staff and teachers who responded to the

survey felt that health impacts a student's ability to learn. Of the staff and teachers surveyed,

64% indicated that attendance would improve if SBTM services were available. More than 76%

of the parents surveyed said they were "not sure", "probably would use a telemedicine program"

or "would use a telemedicine program" (Figure 1). Forty-seven percent of the parents who responded to the survey responded they had to miss work for their child's medical appointment. Seventy-two percent of the parents responded that within the last year their child missed school to see a doctor, dentist or counselor.

Objective #2

Due to unforeseen circumstances, formation of community and stakeholder groups to begin project planning and implementation could not be accomplished in the timeframe allowed. However, the PI did communicate to participants that a work group would be formed in the future with the purpose of planning and implementing the SBTM project. A potential barrier to future project planning and implementation will be the lack of approval or support from CDA school district administrators and district board members to continue the project.

Objective #3

Dissemination of the SBTM plan and results of the needs assessment to a larger community stakeholder's forum is yet to be accomplished. Lack of approval and support from CDA school district administrators and district board members to move forward with such a controversial project in the CDA school district will be a barrier. Alternatively, the PI has been invited to present the project and poster at the SNOI conference on June 9 and 10, 2014.

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Recommendations

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Idaho is a conservative state and one of the last states to embrace SBHCs. It is therefore not surprising that complaints and opposition regarding a new and innovative program were encountered. Identification of stakeholders for planning the SBTM program was the first step in successful stakeholder management (Figure 2). Conducting a thorough needs assessment generated data that supported the need for improved healthcare access and identified potential

barriers and interested stakeholders. In the future, program developers should plan for a lengthy

needs assessment period given the PI's experience. It is recommended that a community forum

be held as previously planned to allow for further stakeholder input and discussion, particularly

given some of the concerns that were voiced subsequent to the survey.

The form cover letter required by the IRB was vague, somewhat confusing, and may have

been intimidating for some North Idaho families. It is recommended that before sending out

mass surveys or other forms of mass communication, program developers take into consideration

the target population in order to avoid some of the misunderstandings that arose during this

project.

School staff including teachers, counselors, school secretaries and other staff interact

daily with students and parents and are a valuable resource for determining what types of

services students in the CDA district need. The low response rates from staff and teachers were a

poor representation of those stakeholders. Multiple auto-generated reminders from

administration to complete surveys may improve their participation.

Program developers need to work closely, collaboratively, and cooperatively with school

district administration and staff to ease communication and consequently reduce the possibility

for misunderstandings, communication gaps and unnecessary delays. Furthermore, developers

need to make sure they understand the role and strength's of the school nurses and need to

recognize that a SBTM program is an expansion of a respected, valuable, and already existing

school health program (Hacker & Wessel, 1998).

It is important to partner with local providers such as physicians, mental health providers

and dentists in order to address the community's documented needs further ensuring that children

will have the access they need to preventative care (Keeton et al., 2012). It is recommended by

the American Academy of Pediatrics (2012), that communication should be facilitated between schools, SBHCs and community primary care providers in order to design a collaborative and integrated SBHC model that supports the medical home and that allows for regular communication with community providers about shared patients. Program developers also need to build community relationships and identify community agencies and partners in order to ensure program acceptance, adoption, and sustainability and to establish relationships for future planning and implementation.

Conclusion

School based telemedicine has been shown to efficiently and affordably deliver health care that is more accessible, comprehensive, focused on prevention, and serves as an adjunct to the student's medical home (Burke et al., 2008). Given the controversial nature of both SBHCs and telemedicine, opposition from stakeholders was inevitable. Assuring support and ongoing participation from school administration and staff will help facilitate program development. Furthermore, building relationships with local providers and the community is essential to development of the program. As SBHCs and telemedicine become more prevalent around the country, they may prove less controversial in the future.

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theory%2F&ei=GmmjUrz3CIzzoATGw4DoAw&usg=AFQjCNHrwBf4f1CALGBFA_akV9

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Katlove.

Appendix A

Subject: ERICA IRB New Study Approval
Date: Sunday, December 22, 2013 2:11:17 PM Pacific Standard Time
From: irb@hsc.utah.edu
To: shellie.norman@utah.edu
CC: pamela.phares@nurs.utah.edu

IRB: IRB_00069038

PI: Shellie Norman

Title: School-Based Telemedicine to Improve Healthcare Access for Rural School-Aged Children

This New Study Application qualifies for an **expedited review** by a designated University of Utah IRB member as described in 45 CFR 46.110 and 21 CFR 56.110. The research involves one or more activities i **Category 7** (published in 63 FR 60364-60367). The designated IRB member has reviewed and approved your study as a Minimal risk study on 12/16/2013. The approval is effective as of 12/22/2013. Federal regulations and University of Utah IRB policy require this research protocol to be re-reviewed and re-approved prior to the expiration date, as determined by the designated IRB member.

Your study will expire on 12/15/2015.

Any changes to this study must be submitted to the IRB prior to initiation via an amendment form.

DETERMINATIONS

- **Waiver/Alteration Determination:** The IRB has determined that the request for **waiver of documentation of informed consent** is approved for this research under 45 CFR 46.117(c).

- **Inclusion of Children as Participants:** The IRB has determined that the inclusion of children is approved under 45 CFR 46.404 and 21 CFR 50.51. One parent/guardian may sign the parental permission document, unless the IRB has approved a waiver of consent for this population.

APPROVED DOCUMENTS

Informed Consent Document
Interview Consent Cover Letter
StaffTeacherConsentCoverLetter10-
16-13.doc Focus Group Consent Cover
Letter ParentalConsentCoverLetter 10-
16-13.doc
Assent Forms
StudentAssentLetter10-16-13.docx
Surveys, etc.
Parent Survey 10-16-13.docx
Student Survey on Telemedicine 10-16-13.docx
Teacher Survey on Telemedicine 10-16-13.docx
Literature Cited/References
IRB References 10-16-13.docx
Recruitment Materials,
Advertisements, etc.
FocusGroupRecruitmentLetter10-16-
13.doc InterviewRecruitmentLetter10-16-
13.docx FocusGroupQuestions10-16-
13.docx
KeyInformantInterviewQuestions10-16-13.docx
Other Documents
SchooiDistrictPermissionForm11-6-13.pdf

Appendix B

Idaho Department of Health and Welfare
Division of Medicaid
Idaho Medicaid Management Information System
PRR 2014-068

Date Range: Federal Fiscal Year (FFY) 2013
Coeur d' Alene Medicaid Children's ER and Well Child Care Utilization

Report Number: PRR 2014-068
Report Date: March 25, 2014

CDA PRR

Based on Dates of Service between 10/2012 - 9/2013	Oct 2012 - Sep 2013									
	Emergency Room Services						Well Child Care			
	Coeur d Alene						Coeur d Alene			
	Ages < 1	Ages 1-4	Ages 5-9	Ages 10-14	Ages 15-17	Total Children	Ages < 1	Ages 1-4	Ages 5-9	Ages 10-14
Enrolled Members	25,200	60,052	67,464	54,419	29,555	**201,365**	25,200	60,052	67,464	54,419
Visits ER (Total)	516	1,190	722	780	668	**3,876**				
Visits ER Inpatient Admits	21	24	60	104	109	**318**				
Visits ER Ambulatory Care	495	1,166	662	676	558	**3,557**				
Visits Well Child								1,171	989	

Notes:

Dates of Service = The dates of services used in the report are the most current full year available.

Coeur d' Alene Area = Is defined by Coeur d' Alene zip codes; 83814, 83815, and 83816.

Emergency Room Services = Emergency Room Services defined by using place of service of ER.
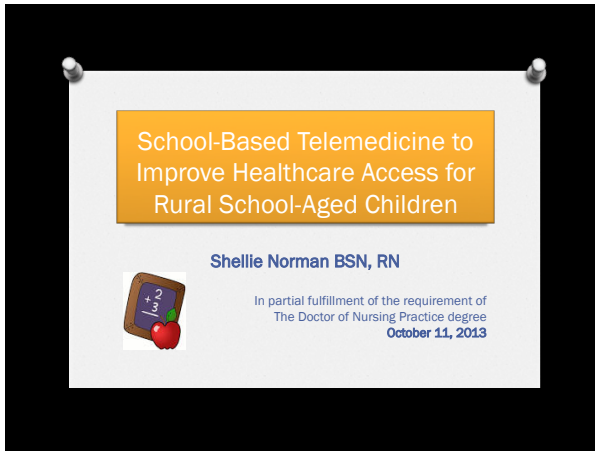
Emergency Room Inpatient Admits = Are those Emergency Room visits that resulted in Inpatient Admissions.

Emergency Room Ambulatory Care = Are those Emergency Room visits that do not require overnight inpatient hospital stay. **Note: Ambulatory ER visits may not equal non-emergent ER visits**

Well Child Care = (Diagnosis Code Principal = V202, V700, V703, V705, V706, V708, V709 or Diagnosis Code Any Secondary = V202, V700, V703, V705, V706, V708, V709 or (Procedure System Code = 1 and Procedure Code = 99382, 99383, 99392, 99393)). Well Child Care identifies well child care provided to children. Source for age, diagnosis, and procedure criteria.
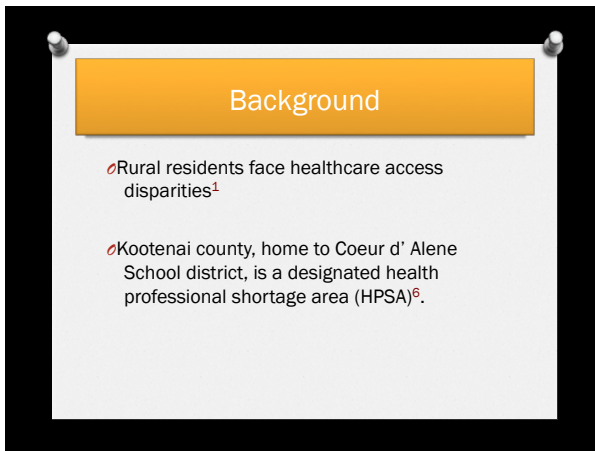
Appendix C

Proposal Defense

Literature Review

o SBHCs are one solution to improving healthcare access[7,8,10].
- o Integral part of school
- o Easily accessed care delivered by a multidisciplinary team

o Other benefits of SBHCs[8]
- o A linkage between health & education systems
- o Provides an entry point and source of primary care

Literature Review

o School-Based Healthcare can be delivered via telemedicine[4]

o Existing School-Based Telemedicine Programs

o Barriers to School-Based Telemedicine
- o Cost[5]
- o Acceptance from physicians and nurse providers[6]
- o Funding[8]

Theoretical Framework Stakeholder's Theory

o Key objective - identify stakeholders[9,11].
- o Build alliances and partnerships

o Conduct a stakeholder analysis[9,11]
- o Explores relationships and prioritizes stakeholders
- o Determines stakeholder's knowledge level
- o Detects misunderstandings and opposition
- o Assures comprehensive representation

Objective #1
Determine essential components of the proposed school based telemedicine program

Implementation	Evaluation
1. Conduct needs assessment using surveys. ▪ Hardcopy to parents ▪ Online to school staff ▪ Conduct focus groups with stakeholders ▪ Obtain Idaho Medicaid Numbers - children not receiving well child exams; identify Title 1 schools – schools with greatest need 2. Submission to IRB	1. Surveys, focus groups and medical data will be collected, collated and analyzed by 2/15/14. 2. Proposed project will be submitted to IRB by 11/1/13.

Objective #2
Involve community partners and other stakeholders in project planning and the implementation plan for the school-based telemedicine program

Implementation	Evaluation
1. Identify community partners and stakeholders. 2. Meet with CDA school district administrators and board members to present results 3. Form a workgroup with at least 1 stakeholder from each group for planning and implementation	1. Community partners and stakeholders will be identified and a workgroup formed by 3/01/14. 2. A forum to present needs assessment data with CDA administrators and district board members will be scheduled by 3/1/14.

Objective #3
Disseminate the development plan and results of the needs assessment at a larger community stakeholder's presentation and at the School Nurse Organization of Idaho (SNOI) annual conference

Implementation	Evaluation
1. Schedule a community presentation. 2. Send out personal invitations 3. Announce the presentation to a wider audience 4. Contact SNOI President to arrange for presentation at 2014 annual Conference	1. Presentation will be held before 3/28/14. 2. A representative number of key stakeholders and partners will be present 3. Timely & visible advertising for forum will be accomplished. 4. Proposed telemedicine program will be presented at the 2014 Annual SNOI Conference.

Summary

- School-based telemedicine is one solution to improve access to healthcare for rural school-aged children.
  - Accessible, comprehensive, preventative
  - Provides an adjunct to student's Medical Home

- This project precedes the feasibility study and actual implementation of school-based telemedicine in the Coeur d' Alene School district.

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Appendix D

Final Defense Poster

School-based Telemedicine to Improve Healthcare Access for School-Aged Children

Shellie Norman DNP Candidate
Primary Care Family Nurse Practitioner Program, University of Utah
Pamela Phares, PhD, APRN-BC, Project Chair
Steve North M.D., MPH & Neil E. Herendeen M.D., MS Content experts

The University of Utah
College of Nursing

PURPOSE

- ❖ Children living in rural communities often experience disparity in access to healthcare services.
- ❖ The purpose of this project is to develop a school-based telemedicine plan to improve access to comprehensive healthcare services for school-aged children that live in the rural community of Coeur d' Alene, Idaho.
  - ❖ Determine essential components of the proposed school-based telemedicine program.
  - ❖ Involve community partners and stakeholders in project planning and implementation for the school-based telemedicine program.
  - ❖ Disseminate the development plan and results of the needs assessment at a larger community stakeholder's forum and at the School Nurse Organization of Idaho (SNOI) Annual Conference.

BACKGROUND

- ❖ Healthcare disparities are numerous for school-aged children living in rural communities.
- ❖ Poor health and childhood illness has broad socioeconomic repercussions for the community.
- ❖ School-based health centers have a number of positive effects for the child.
- ❖ Due to the population density of Idaho it is not possible to address this need with traditional bricks and mortar SBHCs and therefore the development of a school-based telemedicine network is critical
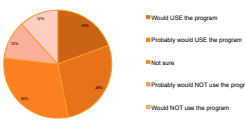
METHODS

- ❖ Electronic surveys were sent to school district parents, students and teachers (Table 1). Community partners and stakeholders were identified.
- ❖ Focus Groups and Key Informant interviews were conducted (Table 1).
- ❖ Title 1-A Schools were identified to ascertain which schools are potentially the in the most need for services.
- ❖ The needs assessment findings were presented to key district administrators.
- ❖ Project findings will be presented on July 9 & 10 at the 2014 annual School Nurse of Idaho Conference.

Table 1. Description of Data Sources.

BARRIERS and LIMITATIONS

- ❖ Lengthy IRB approval and necessary revisions
- ❖ Project timeframe limitations
- ❖ Possible survey bias due to IRB approved cover letter format
- ❖ Communication gaps and misunderstandings
- ❖ Lack of approval or support for planning and implementation from school district administrators and board members.
- ❖ Conservative political climate

NEEDS ASSESSMENT RESULTS

If the above services were available at your child's school through telemedicine would you consider accessing these services for your child?

- Would USE the program
- Probably would USE the program
- Not sure
- Probably would NOT use the program
- Would NOT use the program

Top Healthcare Needs of School-aged Children in the CDA School District
- ❖ Dental
- ❖ Mental health/behavioral health, ADHD
- ❖ Chronic disease management – Asthma, Diabetes
- ❖ Care for illness/injury (sore throat, earache, sprains)
- ❖ Physical exams, sports physicals
- ❖ Information and education about healthy eating & exercise
- ❖ Developmental disabilities

Top Barriers Affecting Healthcare Access for School-Aged Children in the CDA School District
- ❖ Money Issues - lack of money for healthcare, gas, nutritious food, increasing healthcare costs.
- ❖ Transportation issues
- ❖ Lack of time to seek healthcare services/need to work
- ❖ Lack of parental education regarding the need for healthcare services
- ❖ Lack of parental engagement

Essential Components of a School-Based Telemedicine Program
- ❖ Staff- local providers; parents need to trust provider
- ❖ Maintain confidentiality, security & privacy
- ❖ Parents want to be present, in person, or phoned
- ❖ Must collaborate with child's primary provider
- ❖ Parents want to be contacted prior to use
- ❖ Easy to access paperwork and streamline services
- ❖ Open before, during & after school
- ❖ Must not use money allotted for educational use to fund program

Opposition to School-based Telemedicine
- ❖ Concerned costs would "affect school budget".
- ❖ "It is not school's responsibility to provide medical care"
- ❖ "School's don't need more responsibility"
- ❖ "There are no access issues; appointments are easy to get"
- ❖ "Do not want local or federal government involved in child's healthcare".
- ❖ "Not appealing to see provider over a television – impersonal"
- ❖ "It would encourage sick kids to stay or come to school sick"
- ❖ "It would only benefit those that live off the system".

RECOMMENDATIONS

- ❖ Plan for long-term (3-12 months) needs assessment.
- ❖ To assure student input, distribute hard-copy surveys in the classroom.
- ❖ Establish close relationships with school administration, school nurses, school staff and local providers; build community relationships.
- ❖ Get comprehensive representation from those who will be affected by the program (stakeholders).
- ❖ Consider your target population.
- ❖ Go slow- begin school program as a funded pilot project

Student Health

Table 1

Description of Data Sources

Data Source	Description
Coeur D' Alene School District 271 Website	Used to obtain health needs assessment population demographic information http://www.cdaschools.org/domain/213
City-Data	Web-based demographic information for cities in the United States. (Appendix B) http://www.city-data.com/
Idaho State Department of Education	Title 1-A schools were identified to ascertain which schools in the CDA school district have the highest poverty, the greatest educational needs and potentially the greatest need for improved access to healthcare services. http://www.sde.idaho.gov/site/title_one/
Parent Surveys	Electronic surveys sent to parent's email addresses through CDA school district portal Skyward. 427 (4.95%) parents responded
Staff/Teacher Survey	Electronic surveys sent to staff and teacher's school email addresses through CDA school district portal Skyward. 68 (3.93%) staff/teachers responded
Student Surveys	Electronic surveys sent to student's school email address through CDA school district portal Skyward. No (0.00%) students responded
Focus Groups	1/27/14 - Teen Drop-In Center/Crosswalk of North Idaho - 5 present 2/3/14 - CDA School District middle school counselors - 4 present 2/6/14 - Kootenai Health - Department Directors - 5 present 2/6/14 - PTO Borah Elementary - 8 present 2/10/14 - CDA School District School Nurses - 8 present 2/12/14 - Lakes Middle School PTO - 6 present 2/14/14 - Kootenai Alliance for Children & Families - 4 present 2/20/14 - CDA School District High School Counselors - 9 present
Expert Interviews	1/22/14 - Teresa Lancaster - CDA School District Harding Preschool, Preschool Coordinator 1/22/14 - Cindy Wood, Executive Director, Family Promise 1/22/14 - Ben Gaby, Chief Operating Officer, Heritage Health 1/24/14 - Tim Voz - Clinical Supervisor Developmentally Disabled and Crisis Prevention, Health & Human Resources 1/27/14 - Lora Whalen - Director of Panhandle Health District 2/6/14 - Dr. Terrence Neff - Coeur d' Alene Pediatrics 2/4/14 - Kootenai Health-Community and Regional Directors- 2 present

Table 2

Title 1-A Coeur d' Alene School District Schools

School Name	Low Income Enrollment	Total Enrollment	Poverty Rate	School Program Type
Lakes Middle School	309	799	0.637	Schoolwide
Skyway Elementary School	232	520	0.446	Schoolwide
Fernan Elementary School	200	298	0.671	Schoolwide
Borah Elementary School	236	295	0.800	Schoolwide
Ramsey Elementary School	288	630	0.457	Schoolwide
Atlas Elementary School	214	494	0.433	Schoolwide
Bryan Elementary School	224	371	0.604	Schoolwide
Winton Elementary School	177	282	0.628	Schoolwide
Venture Alt. High School	117	132	0.886	Schoolwide
Hayden Kinder Center	139	273	0.509	Targeted Assistance

Table 3

Demographics for Coeur d' Alene, Idaho (Citi-Data.com, n.d.)

Demographic	Number	Rate
Population in 2011	45,579	
Median Household Income in 2011	$39,887	
Land Area	13.1 sq. miles	
Population density	3,472 per sq. mile	
Unemployment Rate July 2013		6.6%
Percentage of residents living in poverty in 2011		15.1%
Race Distribution:		
White	40,041	91.4%
Hispanic	1,865	4.3%
Two or more races	1,078	2.5%
American Indian	290	0.7%
Asian	289	0.7%
Black	180	0.4%
Native Hawaiian and Other Pacific Islander	57	0.1%

Table 4

Demographics for Dalton Gardens, Idaho (Citi-Data.com, n.d.)

Demographic	Number	Rate
Population in 2011	2,353	
Median Household Income in 2011	$57,914	
Land Area	2.38 sq. miles	
Population density	987per sq. mile	
Unemployment Rate July 2013		6.8%
Percentage of residents living in poverty in 2011		11.0%
Race Distribution:		
White	2,207	94.5%
Hispanic	75	3.2%
Two or more races	24	1.0%
American Indian	11	0.5%
Asian	9	0.4%
Black	4	0.2%
Native Hawaiian and Other Pacific Islander	2	0.1%

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Table 5

Demographics for Hayden, Idaho (Citi-Data.com, n.d.)

Demographic	Number	Rate
Population in 2011	13,549	
Median Household Income in 2011	$47,572	
Land Area	7.85 sq. miles	
Population density	1727 per sq. mile	
Unemployment Rate July 2013		6.8%
Percentage of residents living in poverty in 2011		8.2%
Race Distribution:		
White	12,239	92.1%
Hispanic	562	4.2%
Two or more races	236	1.8%
American Indian	103	0.8%
Asian	111	0.8%
Black	19	0.1%
Native Hawaiian and Other Pacific Islander	11	0.08%

Table 6

Demographics for Hayden Lake, Idaho (Citi-Data.com, n.d.)

Demographic	Number	Rate
Population in 2011	585	
Median Household Income in 2011	$61,596	
Land Area	0.39 sq. miles	
Population density	1518 per sq. mile	
Unemployment Rate July 2013		6.8%
Percentage of residents living in poverty in 2011		4.0%
Race Distribution:		
White	547	95.3%
Hispanic	17	3.0%
Two or more races	6	1.0%
American Indian	1	0.2%
Asian	3	0.5%
Black	0	0.0%
Native Hawaiian and Other Pacific Islander	0	0.0%

Figure 1. Parent Survey Question 15

If the above services were available at your child's school through telemedicine would you consider accessing these services for your child?

- Would USE the program
- Probably would USE the program
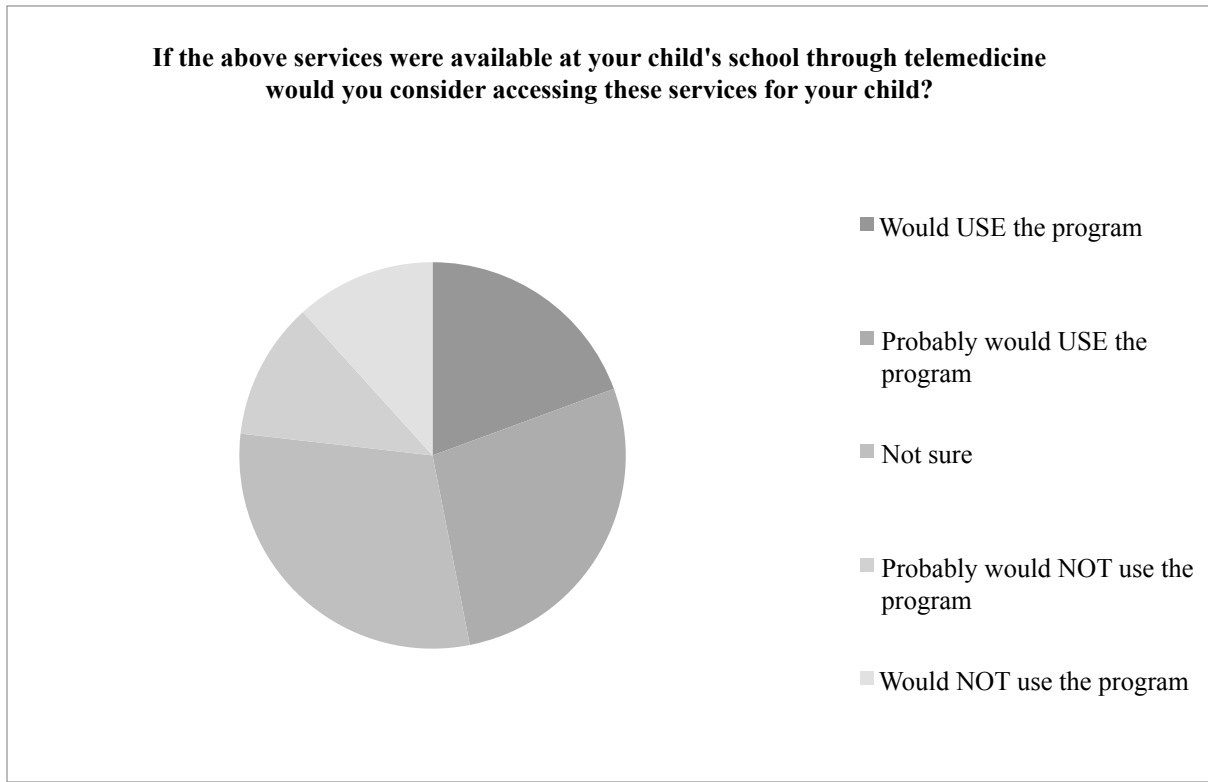- Not sure
- Probably would NOT use the program
- Would NOT use the program

Figure 2. Stakeholder Management