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Safe Practices for Preventing COVID-19 Among School-Aged Children

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Safe Practices for Preventing COVID-19 Among School-Aged Children

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NURS 4500: Nursing Research and Senior Thesis

Dr. Patricia Harris

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Abstract

Communicable diseases and infections are common health problems among children. Among the most impactful communicable diseases present today is COVID-19, a disease caused by a virus named SARS-CoV-2, which has forced many school closures due to rapid transmission. Despite children not being the main driving factor of the spread of the disease, severe complications underlying COVID-19 incidence have resulted in increased hospitalization among school-age children. The initial global response to the spread of COVID-19 included the closure of school systems; however as the disease continues to be effectively managed, communities are starting to re-open schools partially or entirely nationwide. Although pharmaceutical measures are highly effective, this thesis will explore multiple non-pharmaceutical prevention strategies aimed to further reduce the risk of COVID-19 with assessing the impact of health education in school-aged children. This paper will examine the many facets of this topic, separated into three subtopics:

- The Impact of COVID-19 on School-Aged Children,
- The COVID-19 Preventative Intervention Within Schools, and
- The Behavioral Impact in Educating School-Aged Children About Effective Practices.

The main topic and three subtopics are discussed at length through a review of this literature and the paper's proposal.

Introduction

The COVID-19 pandemic is labeled as one of the deadliest pandemics in history, caused by the coronavirus “Severe Acute Respiratory Syndrome Coronavirus 2”, or SARS-CoV-2 for short (WHO, 2022). Coronaviruses are a unique strain of viruses, and the “2” indicates that it is closely related to SARS-CoV-1, the virus that caused the SARS Outbreak from 2002 to 2004. SARS-CoV-2 was first identified in Wuhan, China in late December of 2019 before being declared a pandemic in March 2020 (CDC, 2022). The main mode of transmission is through respiratory droplets exposure; possibly containing the SARS-CoV-2 virus. Infected individuals release respiratory fluids which take the form of droplets and small particles produced through various ways such as: speaking, sneezing or coughing. Aerosol particles and fine droplets may remain suspended in the air from minutes to hours (CDC, 2021). Exposure to the virus can occur through: breathing in air contaminated by fine droplets and particles carrying the virus from an infected person, droplets or particles containing the virus falling onto exposed mucous membranes; which include our eyes, nose or mouth, through sprays from a sneeze or cough, and touching our mucous membranes with soiled hands or after touching contaminated surfaces. Transmission risk is significantly increased when an individual is within three to six feet of a source of infection (CDC, 2021).

As of April 2022, the Centers for Disease Control and Prevention (CDC) has reported 80,476,479 positive cases within the United States, with 4,731,675 positive cases falling under the age group five to eleven years-old. Emphasis is placed on school-aged children as they are a high target population for spread of infectious diseases due to exposure in school and lack of effective health hygiene. Research data has shown that adults ages eighteen to twenty-nine, call

for a majority of reported COVID-19 cases; however, children five to eleven years-old compose the largest percentage of all total cases under eighteen years-old.

The process of infection requires a pathogen (microorganism, bacteria or virus), which inhabits a reservoir (people, surfaces or environment). The infectious agent moves from the reservoir through a portal of exit, and moves through a mode of transmission to a portal of entry. The portal of entry is how the infectious agent enters the susceptible host, completing the chain of infection. In the case of COVID-19, the infectious agent is SARS-CoV-2. SARS-CoV-2 inhabits infected persons, their surrounding air, and environmental surfaces. One of the portals of exit for the disease includes the respiratory tract of an infected person, and when they cough, droplets carrying SARS-CoV-2 are the disease's mode of transmission. The portal of entry is when another person comes into contact with the droplets and rubs their eyes, nose, or mouth. If the person is not immune to SARS-CoV-2, they complete the chain of infection by becoming a susceptible host. Any part of the transmission cycle can be disrupted in order to stop infections from occurring. To achieve this, the most effective non-pharmaceutical interventions must be identified. The objective of the paper is to examine the impact of educating and implementing multiple prevention strategies to reduce the rate of transmission among school-aged children.

Problem Statement

Direct contact is the most common cause of spread of infection; however, indirect transmission should not be ignored when children are around. Oftentimes, children do not regularly wash their hands nor routinely practice adequate hand hygiene (Hockenberry, 2016). This makes their surrounding environment to be more susceptible to transmission. "The most frequent carriers of infection are human hands, which deposit viruses on doorknobs, faucets and other everyday objects" (Hockenberry, 2016, pg. 1259). In the article *Utilizing Academic*

Community Partnerships With Nursing Students to Improve Hand Hygiene in Elementary Students to Reduce Transmission of COVID-19, Perry and colleagues highlight the role nurses and nursing students play in health promotion and education to children (2021). There is growing concern that the increased responsibilities of the pandemic make it difficult for nurses to perform primary interventions such as teaching about healthy practices to children as schools begin to transition back in person; with the other issue being how can lessons on health practices be engaging for the child population. This leaves a gap in vital education around controlling infection and preventing disease for this vulnerable population that calls for close attention.

With the aftermath of COVID-19, children are likely to experience symptoms and conditions triggered by the disease. According from the American Academy of Pediatrics (2022), it has been reported that symptoms and conditions; such as troubled breathing or chest pain related to affect on lungs, cardiac issues like myocarditis (an inflammation of the heart muscle) or symptoms of diabetes could occur related to increased hunger or thirst, weight loss, fatigue and frequent urination in some children who had COVID-19. One of the most severe, yet rare complications of COVID-19 that could occur in children is a condition known as multisystem inflammatory syndrome (MIS-C). The condition is characterized by a severe inflammatory response of the human body, in which vital organs such as the heart, lungs, kidneys, gastrointestinal organs or the brain can become inflamed. Approximately 7,880 cases of MIS-C have been identified with a total of 66 MIS-C-related deaths (CDC, 2022). The Centers for Disease Control and Prevention (2022) is currently investigating the source of occurrence and why only a few children develop MIS-C, while others do not. What has been discovered is that it may occur two to six weeks after developing an acute SARS-CoV-2 infection and results in many different clinical manifestations and complications. A child with MIS-C may present with

an ongoing fever accompanied by either stomach pain, diarrhea, dizziness, feeling of being lightheaded, skin rash or vomiting (CDC, 2022). And because it is difficult to initially distinguish from other diseases and illnesses or the direct cause is unknown, it would be best to prevent the risk of SARS-CoV-2 transmission altogether with safe practices.

Purpose Statement

The purpose of this thesis is to identify effective methods that can be implemented in teaching safe practices for the prevention of the spread of COVID-19 among school-aged children. An overview of the literature will be presented, followed by a proposal for further research geared towards exploring the topic further. With consistent and correct implementation of prevention strategies in the school environment, the risk of SARS-CoV-2 transmission is reduced. Layered prevention, or use of multiple strategies, provides greater breakage of transmission chains than implementing a single strategy.

Research Question

The research question for this study is: What are effective methods that can be implemented in teaching safe practices for the prevention of the spread of COVID-19 among school-aged children?

Literature Review

The following literature review analyzes recent research studies and information in regards to the effectiveness of different COVID-19 health control measures, including its impact on the health behavior of school-aged children.

The articles used for this review were retrieved from the following databases: Pubmed, Academic Search Complete, Google Scholar and Dominican's Up-to-Date. With each database,

the search terms used to find each article included: *school-age children, education, COVID-19, prevention, hand hygiene, masks, and chain of infection*. Criteria for the articles included having school-aged children or parents of school-aged children participate in the study, as well as the education and practice of health control measures within the context of COVID-19. Seven articles were selected for this literature review, and were categorized under the following subheadings: Impact of COVID-19 on School-Aged Children, COVID-19 Preventative Intervention Within Schools, and Behavioral Impact in Educating School-Aged Children About Effective Practices.

Impact of COVID-19 on School-Aged Children

Infections and infectious diseases have been one of the top ten major causes of deaths across the nation for children five to eleven years of age, with COVID-19 rapidly following behind (CDC, 2021). The transmission of COVID-19 within children was initially mischaracterized at the onset of the global pandemic. According to the Centers for Disease Control and Prevention (2021), it was common for the child population to not have been classified as index cases due to the nationwide ordinance of school closures, making fewer opportunities for children to be exposed. It was also believed that school-age children have lower incidence rates than adults considering children appear more commonly as asymptomatic or have mild, general symptoms of illness. School closures and low rates of incidence have falsely attributed to the lower likelihood of being tested (CDC, 2021).

In the article, *Impact of SARS-CoV-2 Vaccination and Paediatric Age on Delta Variant Household Transmission*, Ng and her team conducted a retrospective cohort study which includes 8,470 COVID-19 Delta-variant exposed close-contacts quarantined in their household. The household's high transmission risk setting paired with frequent testing were ideal conditions

in order to assess the impact that vaccination and age has on transmission, with the pediatric population in particular (Ng et al., 2022). The retrospective study considered contact-tracing data from the Singapore Ministry of Health from March to August 2021, indexing 8,470 household close-contacts who were not reinfected and were only Delta-variant community cases, not imported or overseas cases of infection (Ng et al., 2022). The main findings of the retrospective cohort study was that vaccination and the type of vaccination had a significant impact on transmission as well as the severity of symptoms of the COVID-19 Delta-variant. With respect to age, it has been reported that children under eleven years of age had a higher rate of transmission than adults (Ng et al., 2022). Ng's research illustrates the impact that COVID-19 holds on school-age children. From an epidemiological perspective drawn by the conclusions made from Ng and her team, greater attention must be given to the pediatric population, who are statistically higher at risk for susceptibility of COVID-19 than other populations, thus signaling their high transmissibility.

Once schools began to reopen, SARS-CoV-2 transmission was demonstrated through outbreaks among children attending sport events, camps and schools. Although school closures may seem ideal for preventative measures, schools are an important part of infrastructure within communities, definitively supporting and nurturing children's social, emotional, and physical well-being. The National Institute for Early Education Research regarded the pandemic as a deprivation of crucial academic and social learning opportunities within school-age children, contributing to higher levels of serious altered social and emotional behavior (Barnett, Jung 2021). An additional part of why schools are integral to communities are the services they provide to families: Parents' work productivity has suffered from the overwhelming responsibility of child care and facilitating virtual learning. It is also reported that not all pre-

school children in families that qualified for Head Start, a government nutritional support program, received free meals (Barnett, Jung 2021).

In effect, closing schools would cause a larger impact as opposed to attending school in-person. Home and classroom experiences in early childhood would allow children to build a foundation for future success in school and life. In order for a safe transition from remote learning to in-person education, the proper health and safety measures must be ensured in schools. Without these measures, outbreaks would quickly propagate without hindrance.

COVID-19 Preventative Intervention Within Schools

Schools provide children opportunities to interact within a social community, often participating in classrooms and activities that promote the spread of germs and diseases, and with the reopening of schools nationwide, new case studies have provided information that can help evaluate how effective interventions are at reducing transmission within school settings. Currently, there are pharmaceutical and non-pharmaceutical measures being used against COVID-19. Although pharmaceutical measures prove to be the most effective way of protecting ourselves from COVID-19, vaccinations do not make individuals immune to the disease and growing rates of cases calls for layered prevention strategies to limit transmission. Similarly, as of April 2022, COVID-19 boosters are only available for people ages twelve and up (CDC, 2022). This leaves the child population ineligible for receiving the booster shot; therefore, implementing the most effective preventative measures can be put into place until booster vaccines are made available to the child population.

In the article, *Hand hygiene, mask-wearing behaviors and its associated factors during the COVID-19 epidemic: A cross-sectional study among primary school students in Wuhan, China* by Chen assessed the situation of hand washing and face masks for children, when the

government was only advocating for hand hygiene and mask wearing for the general population (Chen, 2020). Chen and his team conducted a cross-sectional study of 9,145 students from 15 primary schools using a simple random sampling technique. A structured questionnaire asking the student's demographic, hand hygiene, and mask-wearing behavior was used to examine good hygiene and any links between hand washing and mask-wearing with their demographic (Chen, 2020). The survey revealed that factors associated with hand hygiene included students' tendency to go out in public, their gender, grade, and parents' background, while factors associated with mask-wearing also included gender and grade (Chen, 2020). A consistent practice of hand washing and face masks within children is a simple, cheap, and effective way to curb the spread. Hand washing can reduce transmission risk by as much as 55%. Similarly, surgical masks can block 68% of infectious agents, with N95 masks blocking 91% of infectious agents (Chen, 2020). However, only 42.05% of children demonstrated exemplary hand hygiene— well below the expectation of the research team. Only 32.07% of children used properly fitted face masks despite being a susceptible population (Chen, 2020). The study shows that government and parents' promotion of hygiene bears vital importance on children's behavior. It also reveals that even when hand washing and mask-wearing was advocated to the general public, there was a poor retention rate within children.

During the time of Chen's study in 2020, mask mandates were heavily enforced within communities. With mask mandates slowly being lifted in several states the CDC has created a tool to aid communities in deciding what steps to take to prevent the spread of disease. When a county is placed under high community level, this means the risk for illness is higher and the CDC recommends that individuals wear well-fitting masks regardless of vaccination status or

individual risk; in consideration for more vulnerable populations (CDC, 2022). This is especially important for those who are attending schools, where susceptibility for transmission is high.

Ventilation improvements are an additional method of intervention that is beneficial as well as cost-effective. It is a viable option for areas where a mask mandate is not enforced. In the study, *Mask Use and Ventilation Improvements to Reduce COVID-19 Incidence in Elementary Schools*, Gettings sought to examine the effectiveness that CDC recommendations of ventilation have on COVID-19 incidence within American schools (Gettings, 2020). At the beginning of fall 2020, many schools in Georgia opened up their classrooms for in-person instruction. They were asked to track multiple student and school characteristics through weekly online surveys, including the frequency of COVID-19 incidences, over a span of 26 days. 169 schools answered “yes” to if they were taking active measures in ensuring indoor air quality, and each of these schools were further examined by researchers for the types of prevention strategies that they used, such as mask-wearing, ventilation through air purification and filtration, and improving indoor circulation (known as air dilution) via opening windows and doors (Gettings, 2020). Researchers have found that the incidence of COVID-19 was 37% lower in schools that enforced mask-wearing and improved circulation. Combining all three methods of mask-wearing, improved circulation, and ventilation reduced incidence by 48% (Gettings, 2020). This supports the recommendations of the CDC, and that the more schools added to their safety protocols, the further the reduction of spread.

Without multi-layered preventions, outbreaks in schools are more likely to occur. This was shown in the study *School Closures Reduced Social Mixing Of Children During Covid-19 With Implications For Transmission Risk And School Reopening Policies*, where Head et al. had conducted a survey of school-aged children within the Bay Area to examine the rate of social

contact for each individual, taking into account factors such as age, household income, race, and number of family members (Head, 2021). Head and the team used the data for a time-discrete, age-structured, individual-based transmission model with a virtual population of 1,000 people accurate to the demographic of the Bay Area with one person representing 25 real life people, in order to simulate different SARS-CoV-2 transmission scenarios (Head, 2021) including no masks or social distancing. Head's research reveals that outbreaks were less likely to occur when face masks and social distancing were required. However, the effectiveness of social distancing depended on concurrent preventative measures, suggesting that social distancing is the least effective intervention but nevertheless essential for when schools are open (Head, 2021). Frequent social gathering and interaction in schools create a susceptible environment for spreading the disease. Head emphasized the detriment school closures would have on healthy child development if they continue long-term; in response, the researcher and their team discovered combining universal mask wearing in classrooms as well as staggering class schedules can decrease the amount of cases (Head, 2021).

Practice of the effective methods mentioned in the literature curbs the transmission of SARS-CoV-2 within the general population; especially within children returning to school. Simultaneous efforts of multiple preventative methods strengthen their effectiveness in health protection instead of one single measure being practiced. Transmission within schools and early education programs are reduced further with promotion of pharmaceutical and non-pharmaceutical measures combined. Barriers to successful implementation occur if these safe practices are not carried out diligently and consistently. Guidance from important figures such as parents or guardians, and health care providers alike, can aid in educating school-age children about how to practice these measures properly.

Behavioral Impact in Educating School-Aged Children About Effective Practices

Crowded settings, shared objects and insufficient self-care skills all factor to the transmission of microorganisms, particularly in elementary schools where current educational activities may require close and cooperative interaction between children. SARS-CoV-2 is known to spread through fine respiratory droplets or aerosol particles of an infected person, and in some circumstances, surfaces may be contaminated when touched by them. This means the disease is readily transmitted either directly, indirectly by inanimate objects and by contaminated hands, where nurses can expect secondary spread of disease in school-aged children. School-aged children are easily distracted by their peers and the activities that surround them, this may affect their ability to remember to wash their hands or their ability to properly clean their work areas. There is an ongoing need for improvement of health education in order to protect children and educational facilities from the continuous threat and spread of COVID-19. With partnership-based approaches, parents, teachers, faculty, nurses or even nursing students can play pivotal roles in changing the way health behaviors are performed.

In the study *Investigating Preventive Health Behaviors Against Covid-19 In Elementary School Students' Parents: A Cross-Sectional Study From Tehran – Capital Of Iran*, Bagherzade et al. reveals that parent's use of protection motivation theory (PMT) was an effective method for improving children's mask-wearing, hand washing, and social distancing behavior (Bagherzade, 2021). In this cross-sectional study, 660 elementary school-age children's parents were surveyed utilizing the Likert scale for what they knew and felt about COVID-19, as well as how they intend to prevent it, their self-reported health, perceived susceptibility and severity, self-efficacy, response-efficacy, and how their preventative behavior was motivated by fear. It was found that PMT constructs strongly correlated with preventative practices, with knowledge being the most

important variable. Age bears the strongest direct relationship for preventative behaviors, with older populations feeling more responsible for their health (Bagherzade, 2021). This study shows that parents are the principal role model for their children, as teaching them has the most impact on preventative behavior. Similarly, Bagherzadeh concluded that individuals will be more likely to engage in protective behaviors if they are aware of the costs, risks and consequences of the disease (Bagherzade, 2021). Parents' conscious and diligent effort to reinforce these healthy habits will be effective in reducing the risk of infection.

While children's parents or guardians can influence behaviors through modeling behavior, healthcare professionals (such as nurses) can aid in public awareness and health education of ways to prevent COVID-19 transmission in classrooms. According to the study, *Utilizing Academic-Community Partnerships With Nursing Students to Improve Hand Hygiene in Elementary Students to Reduce Transmission of COVID-19*, Perry and her team conducted a community-based needs assessment through interviews with a Tennessee elementary school's faculty, teachers and other administrators (Perry, 2021). The school's health supervisor had reported requests from several schools for assistance with hand-washing education from a district level. Barriers discovered in meeting needs included: lack of curriculum or the funds for one and insufficient staff knowledge to create a curriculum (Perry, 2021). As a result, a framework was designed in order to educate children in a developmentally and intellectually appropriate way, meeting the need for health education and health resources in school communities particularly during COVID-19 (Perry, 2021). Five teachers were trained hands-on alongside a team of nursing students to conduct a 20 minute hand hygiene lesson, so that staff were prepared to teach lessons independently for future classes. In total, 232 students participated in the lesson, including 94 students being taught by the five teachers without guidance from nursing students.

This framework further highlights the role school nurses and nursing students have as valuable partners to schools. The research advocates for a partnership between nursing programs and schools, as it is a sustainable strategy for educating students about vital health knowledge especially in shorthanded schools where nurses and health promotion staff are limited (Perry, 2021).

When greater attention is given to the population most susceptible, the incidence of COVID-19 as a whole is more effectively reduced. From the findings, modeling and teaching prove to be effective means of preventing infection within school-age children, providing strong reinforcement of preventative behavior such as hand hygiene. Behavior guidance and proper health education are important factors of primary prevention; these can influence students to become advocates themselves for disease prevention by opening up conversations within their family and peers.

Overall Discussion of the Literature

The literature review has identified the prolonged effects of school closures and evaluated the Centers for Disease Control and Prevention's (CDC) response of implementing health safety strategies against frequent transmission of COVID-19. Children under eleven years of age have a higher rate of transmission than adults, and contrary to the benefit of school closures, children suffer from altered social and emotional development as a result of being deprived from schools, which are an integral part of communities. The literature review recognizes practice of hand-washing and mask-wearing, as well as improving ventilation and dilution methods in classrooms of school-age children to be the most effective non-pharmaceutical methods.

To heighten awareness or make lasting impressions about good health behaviors among school-aged children, adults may participate in modeling good health behavior and practices, as

well as school nurses and nursing students providing age-appropriate education in classrooms. The literature reviewed is not a conclusive assessment of the school-age population, as it is under-studied due to the recency of COVID-19; additional studies are necessary in order to support continued assessment.

Even though children may get vaccinations, it does not mean that they are completely immune. This further underscores the importance for non-pharmaceutical intervention for children to be studied closely. The studies support a general emphasis on children for COVID-19 intervention as the improvement of public health education is strongly urged for this susceptible population, as well as the role of school nurses and nursing students being essential for community health resources.

Proposal for Further Study

Overall Research Question

After discussing seven articles in the literature review, simultaneously practicing non-pharmaceutical interventions within schools were proven to be effective in slowing transmission rates amongst children. With newfound understanding of how much of an impact each preventative measure carries, a study will be proposed for further research with the aim of answering the following questions:

- How can safe practices for preventing COVID-19 among school-aged children be taught effectively?
- For school-aged children, does providing education about the prevention and control of COVID-19 through effective safe practices either influence or improve their health behaviors?

The Rationale for Proposed Study

Though it is argued that there are currently pharmaceutical interventions for protecting individuals from contracting COVID-19, there are currently COVID-19 booster shots being recommended in order to best protect ourselves against infection; in which one of the criterias for eligibility for a booster vaccine is only people ages twelve and above (CDC, 2022).

Therefore, focusing primarily on non-pharmaceutical interventions would be most beneficial for school-aged children ages five-to-eleven to receive proper health education and demonstrations. Preventative measures and protocols have been in place since the COVID-19 was declared a pandemic. Despite this, only 42% of pupils showed excellent hand-washing cognition and behavior (Chen, 2020). With a need for health education and promotion, this proposed study can further evaluate the impact of the effectiveness of safe practices within school-aged children when performed consistently and correctly in classrooms.

Theoretical Framework

The first theoretical framework that supports the proposed research study is the Health Promotion Model. This nursing theory was first developed by Nola Pender in 1982, with revisions in 1996 based on the change of theoretical perspectives and empirical findings. The main purpose of this model is to assist nurses in understanding the major determinants of health behaviors, which in turn can be used to provide behavioral counseling to promote healthy lifestyles (Peptiprin, 2020). Pender emphasizes that collaboration among patients, families and communities is a vital component in a nurse's role in order to create best conditions for achieving optimum health and increase levels of well-being. According to Pender, there are five key concepts in the Health Promotion Model which includes: person, environment, nursing, health and illness. With the five key concepts in mind, the characteristics and life experience of

each individual directly impacts their behavior, with the health of the individual being defined as the actualization of human potential. This actualization comes about through intentional, goal-oriented behavior, mindful relationships, and self-care. It is important to consider personal factors and interpersonal or situational influences that could impact their likelihood of engaging health promoting behaviors, as a foundation can be created to structure nursing protocols and interventions. The Healthy Promotion Model focuses on individual characteristics and experiences, behavior-specific cognitions and affect and behavioral outcomes with an endpoint or outcome directed toward attaining positive health outcomes (Peptiprin, 2020). Utilizing this theory is essential to supporting the proposed study since the main focus is to promote safe practices to prevent further transmission of disease.

To strengthen the proposed study further, a second theoretical framework has been selected to provide additional support. Dr. Albert Bandura developed the Social Learning Theory in 1977 (McLeod, 2016). Bandura's theory derived from behaviorist learning theories of classical and operant conditioning, where he aimed to explore two important ideas: mediating processes occurring between stimuli and responses and behavior being learned by one's environment through observational learning. Bandura illustrated this during his famous Bobo doll experiment in 1961, in which he tested his hypothesis that children observe and interact with the people around them and become influenced by modeled behavior. In today's society there are many influential models such as parents, television networks, social media, peers and teachers at school that can provide examples of behaviors to observe and imitate (McLeod, 2016). His study supported this idea as children who observed aggressive models of behavior displayed far more aggression in the form of imitation versus those who were modeled non-aggressive behaviors, or control groups. Through his discovery, Bandura proposed four mediational processes: attention,

retention, reproduction and motivation. Through his discovery, Bandura proposed four mediational processes: attention, retention, reproduction and motivation. A behavior cannot be reproduced unless an individual pays close attention to the modeled behavior. This means one's thought process and influential factors, such as how willing they are to perform the behavior, must be carefully considered. This is important to note because individuals are within different stages of cognitive development.

During the school-age stage of cognitive development, children are able to use thought processes to undergo events and actions (Hockenberry, 2016). Throughout these years, relationships between things and ideas begin to connect as they also progress into conceptual understanding. School-age children are also able to focus on tasks for longer periods of time. Integration of Pender's Health Promotion Model and Bandura's Social Learning Theory strengthens the outcomes of effective teaching methods and optimizes children's learning in regards to safe practices for preventing the spread of COVID-19. When considering factors that enhance a child's cognitive learning experience, their motivation and willingness to demonstrate the healthy promoted behavior being modeled increases.

Primary Research Aims

The main goal for this primary research is to evaluate the effectiveness of providing education and demonstration to school-age children about the safe practices explored in the literature review. Questions to be answered specifically are:

- With close consideration of the school-age stage of cognitive development, what are activities or ways to engage children in participating in health behaviors?
- Can the implemented health lesson and demonstration be applicable to all elementary school grades?

Ethical Considerations

Approval from the Internal Review Board (IRB) is crucial to beginning the study especially since additional requirements upon the IRB have been imposed by federal regulations for vulnerable research participants. This study requires collaboration and participation from researchers, school-age children, teachers and any necessary staff or faculty such as the school's nurse; all who are considered vulnerable populations. Ethical considerations to account for include: protection of privacy, the study involving minimal risks and consent from parents or guardians with assent by children.

To protect the privacy and confidentiality of participants involved in the study, the survey that will be distributed will not require any form of identification and will therefore, remain anonymous. The only identifier is the grade number, which is representative of the grade's school teachers and their students. Any data or study information will be stored in a password-protected computer that can only be accessed by research members.

The goal of the proposed study is to identify ways to engage students in practicing effective health behaviors that protect us from contracting COVID-19. The research being conducted involves minimal-to-no risk for the vulnerable populations. Students involved in the study will be monitored, and assisted if needed, by trained research nurses, nursing students or teachers and staff; who are also trained.

To emphasize, all participants involved in the study will be informed of the steps and procedures and can choose to remove themselves at any point during the study. Informed consent must be given from the elementary school(s), staff and other faculty, teachers, parents or guardians and students assent. Assent is defined as a child's agreement to participate in the study.

Research Methods

Research Design

Using a qualitative, cross-sectional study approach will be the most effective method for conducting this research study. Participants will be purposefully selected to participate in education intervention.

Population

The target population for this study include children who attend elementary school in-person in Solano County, Bay Area. This is limited to the school-age population which is considered ages six to twelve.

Sample Size

The sample size for this proposed study will include a minimum of 100 students. At least one class from each grade will be purposefully selected. Classes from each grade will only be selected based on consent from the student's parent or guardian and their teacher, who granted their instruction time to participate.

Strategy of Recruitment

Proposed strategies for recruitment include direct contact with the school's principal or staff; such as email or telephone call. Social media has become a popular source of information and communication, oftentimes, school's run their own social media pages or profiles. This can also be another way of recruiting participants. If a school is interested in participating in receiving health education as part of the study, they may contact the research team by telephone or email. Once researchers have obtained IRB approval, and approval of all participants; including children and their parents or guardians, the study may proceed to the next step.

Researchers could also suggest taking the time to discuss with faculty the purpose of the study; in which is to promote health education using a toolkit or framework that can be used to train other teachers and staff to teach to their students. Incentives include allowing schools to utilize the tool if it is approved and effective, and for the students goodie bags that promote health, similar to one given in dental offices after an appointment, can be given out after the lesson and demonstration. The goodie bag may include a designed mask, an “All About Me” (poster that helps students get to know each other even when socially distanced), hand sanitizer, etc.

Methodology

After informed consent is obtained, teachers and faculty will be interviewed regarding what aspect of safe practices for preventing COVID-19 would they like to be emphasized in their classroom.

An educational seminar will be conducted for one class from each grade about the different preventative practices discussed in the literature review: Hand-hygiene, social distancing, mask-wearing and ventilation. A trained nurse or nursing student from the research team will conduct the lesson while one other researcher, the class teacher and other faculty observe. The seminar will begin with a pretest to determine a baseline of the students’ knowledge or awareness of health practices. After the pretest, a presentation on a large screen that is colorful with visuals, followed by demonstrations and activities (more detailed lesson plan in appendix c).

A return demonstration and participation will be asked from the students for all the activities. Once the activities are completed, a post test will be conducted followed by a closing discussion where students will reflect about what they learned during the educational lesson.

After students return the post test, incentives may be given mentioned in the *strategy for recruitment* section; goodie bags that relate to the health education lesson. Students may also be given a pamphlet with the goodie bag that summarizes the main points of the lesson to take home and demonstrate to their families.

Content Analysis of Qualitative Research

Pretests and post tests will be collected during the health education lesson. Data for this cross-sectional study will be organized into a table which is then separated into pre-test and post test. Each question of the tests has a right or wrong answer. The number of correct responses or wrong responses will be out of the number of students in the class. For instance, if 10 out of 28 students said “Yes” to “I wash my hand before I eat” during the pre test, with 20 out of 28 students saying yes during the post test, then that would mean 35% of students said yes to washing their hands before the lesson and 71% of students said yes after the lesson, showing a 36% increase in understanding of knowing that hand hygiene should be performed before they eat.

Conclusion

The literature review has gathered information that evaluates the impact health education may have on school-aged children and their health behaviors. The effective safe practices that were explored in the literature review have been proven to reduce the transmission of SARS-CoV-2 within schools when simultaneously practiced consistently and correctly. Practicing these preventative measures in schools can help prevent complications from arising in school-age children and allow a more safe transition back to classrooms. The proposal can offer a way to promote health behaviors in an engaging manner that motivates school-age children to follow the behavior or practice demonstrated to them and possibly influence the way they view their health.

The study can be carried further by expanding research to other counties of the Bay Area or even other regions, evaluating the effectiveness of implementing a curriculum to school-age children to participate in every year to emphasize the importance of health safety.

References

- American Academy of Pediatrics. (2022, March 18). Post-covid conditions in children and teens. <https://www.healthychildren.org/English/health-issues/conditions/COVID-19/Pages/Post-COVID-Conditions-in-Children-and-Teens.aspx>
- Bagherzadeh, M., Salehi, L., & Mahmoodi, Z. (2021). Investigating preventive health behaviors against COVID-19 in elementary school students' parents: A cross-sectional study from Tehran - Capital of Iran. *Journal of education and health promotion*, 10, 435. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8719560/>
- Barnett, W.S., & Jung, K. (2021). Seven Impacts of the Pandemic on Young Children and their Parents: Initial Findings from NIEER's December 2020 Preschool Learning Activities Survey. New Brunswick, NJ: National Institute for Early Education Research. ERIC: ED613105 <https://nieer.org/research-report/seven-impacts-of-the-pandemic-on-young-children-and-their-parents-initial-findings-from-nieers-december-2020-preschool-learning-activities-survey>
- Centers for Disease Control and Prevention. (2022, April). CDC Covid Data tracker. Atlanta, GA: US Department of Health and Human Services, CDC. Retrieved April 21, 2022, from <https://covid.cdc.gov/covid-data-tracker/#datatracker-home>
- Centers for Disease Control and Prevention. (2021, December 15). Science brief: Transmission of SARS-COV-2 in K-12 schools and early care and education programs - updated. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/transmission_k_12_schools.html#schools-cov2-transmission
- Chen, Xuyu & Ran, Li & Liu, Qing & Hu, Qikai & Du, Xueying & Tan, Xiaodong. (2020). Hand Hygiene, Mask-Wearing Behaviors and Its Associated Factors during the COVID-

- 19 Epidemic: A Cross-Sectional Study among Primary School Students in Wuhan, China. *International Journal of Environmental Research and Public Health*. 17. 2893.
<https://doi.org/10.3390/ijerph17082893>
- Gettings, J., Czarnik, M., Morris, E., Haller, E., Thompson-Paul, A. M., Rasberry, C., Lanzieri, T. M., Smith-Grant, J., Aholou, T. M., Thomas, E., Drenzek, C., & MacKellar, D. (2021). Mask use and ventilation improvements to reduce COVID-19 incidence in elementary schools — Georgia, November 16–December 11, 2020. *MMWR. Morbidity and Mortality Weekly Report*, 70(21), 779–784.
<https://doi.org/10.15585/mmwr.mm7021e1>
- Head, J. R., et al. (2021). School closures reduced social mixing of children during COVID-19 with implications for transmission risk and school reopening policies. *Journal of The Royal Society Interface*, 18(177). <https://doi.org/10.1098/rsif.2020.0970>
- Hockenberry, M. (2016) *Wong’s Essentials of Pediatric Nursing (10th ed)*. Mosby, Inc.: St. Louis, MO.
- McLeod, S. A. (2016, February 05). Bandura - social learning theory. *Simply Psychology*.
www.simplypsychology.org/bandura.html
- Ng, O. T., Koh, V., Chiew, C. J., Marimuthu, K., Thevasagayam, N. M., Mak, T. M., Chua, J. K., Ong, S. S., Lim, Y. K., Ferdous, Z., bte Johari, A. K., Cui, L., Lin, R. T., Tan, K. B., Cook, A. R., Leo, Y.-S., & Lee, V. J. (2022). Impact of SARS-COV-2 vaccination and paediatric age on Delta variant household transmission. *Clinical Infectious Diseases*.
<https://doi.org/10.1093/cid/ciac219>
- Perry, J., McClure, N., Palmer, R., & Neal, J. L. (2021). Utilizing academic–community partnerships with nursing students to improve hand hygiene in elementary students to

reduce transmission of COVID-19. *NASN School Nurse*, 36(6), 333–338.

<https://doi.org/10.1177/1942602X20986958>

Petiprin, Alice. Pender's Health Promotion Model. *Nursing Theory*. (2020, July 21).

<https://nursing-theory.org/theories-and-models/pender-health-promotion-model.php>

Appendix A

Literature Review Table

| Authors/Citation | Purpose/Objective of Study | N | Sample - Population of interest | Study Design | Study Methods | Major Finding(s) | Strengths | Limitations |
|---|--|-------|--|---|--|---|--|---|
| Bagherzadeh, M., Salehi, L., & Mahmoodi, Z. (2021). Investigating preventive health behaviors against COVID-19 in elementary school students' parents: A cross-sectional study from Tehran - Capital of Iran. <i>Journal of education and health promotion, 10</i> , 435. | The objective of this study is to investigate factors affecting the preventative behavior in elementary school students' parents based on protection motivation theory (PMT) | 660 | The target population for this study are parents of elementary school students. Multistage sampling was used. | Cross-sectional study, Descriptive statistics and Analytical Statistics | Multi-sectional questionnaire, including sections on demographic characteristics, PMT constructs, self-reported health and information sources related to COVID-19. PMT questions scored on a 5-point Likert scale; 1 being definitely disagree and 5 being definitely agree. | There is significant association between all PMT constructs and preventative behaviors. Preventative behaviors had the strongest, direct relationship with age. Knowledge had the greatest impact on preventive behaviors through indirect and direct routes. The more awareness of the individuals related to the consequences and costs of the disease, the more the likelihood of their protective behaviors will be. | The study looks at children's health behaviors from a different approach with consideration of their adult figures (parents, guardians). Uses protection motivation theory to support their findings which lead to the discovery of a correlation between independent variables and preventative behaviors. | Online surveys limited guidance available to responders, potentially influencing their responses. Though children's behavior was expected to be influenced by their parents, how children's behavior was acquired through cognitive learning was not measured. |
| Barnett, W.S., & Jung, K. (2021). Seven Impacts of the Pandemic on Young Children and their Parents: Initial Findings from NIEER's December 2020 Preschool Learning Activities Survey. New Brunswick, NJ: National Institute for Early Education Research. ERIC: ED613105 | The purpose is to explore the seven impacts of COVID-19 on children's education. | 1,001 | The target population of the study consisted of non-institutionalized U.S. adults age 18 and older with at least one child in their household ranging from age 3 to 5 years old. | Qualitative study | A survey sent via email to selected panel members was asked questions regarding their 3-5 year-old child regarding items such as the child's daily activities during the pandemic and the child's childcare and preschool as well as program experiences before and during the pandemic. | The pandemic has largely impacted upended homelife and preschool programs, making it more challenging for both parents and communities to provide optimal learning experiences for young children's learning and development. | The study included a large sample size. Study-specific post-stratification weights have been applied to the final sample to adjust for survey nonresponse to ensure proper distributions for the specific target population. | Recall bias of information may have occurred which can impact the results of the survey. |

| Authors/Citation | Purpose/Objective of Study | N | Sample - Population of interest | Study Design | Study Methods | Major Finding(s) | Strengths | Limitations |
|---|---|-------|---|--|--|---|---|---|
| https://nieer.org/research-report/seven-impacts-of-the-pandemic-on-young-children-and-their-parents-initial-findings-from-nieers-december-2020-preschool-learning-activities-survey | | | | | | | | |
| Chen, Xuyu & Ran, Li & Liu, Qing & Hu, Qikai & Du, Xueying & Tan, Xiaodong. (2020). Hand Hygiene, Mask-Wearing Behaviors and Its Associated Factors during the COVID-19 Epidemic: A Cross-Sectional Study among Primary School Students in Wuhan, China. <i>International Journal of Environmental Research and Public Health</i> . 17. 2893. https://doi.org/10.3390/ijerph17082893 | To grasp a better understanding of the current situation of hand hygiene and face masks among primary school students in Wuhan, China, where COVID-19 originated. | 8,569 | A total of 9145 students from 15 primary schools in Wuhan, China participated in the study; however, 576 were excluded with exclusion criteria of (1) filling time less than 90s; (2) repeated filling (IP and basic information are completely consistent); (3) information of residence or school is missing. | Cross-sectional and Quantitative study | An online questionnaire was forwarded to the student's parents by the school teacher and was filled in by the students uniformly with the supervision of their parents. A simple random sampling technique was conducted. | Hand hygiene is remarkably important element of infection control Appropriate hand washing intervention could break transmission cycle and reduce risk between 6% and 44% N95 masks and surgical masks could separately block 68-91% of pathogens. Educational level of parents can explain increased awareness of perceived susceptibility and severity of infection. | The study analyzes different social/biological factors such as gender, grade, outgoing history, father's occupation, and mother's educational background. The study also acknowledges its own limitations within their research. | Recall bias and social desirability bias may be caused by self-reported property of the research. Cause-effect relationships cannot be established due to the inherent nature of cross-sectional design. |
| Gettings, Jenna, et al. "Mask Use and Ventilation Improvements to Reduce COVID-19 Incidence in Elementary Schools — Georgia, November 16–December 11, 2020." <i>MMWR</i> . | To evaluate the effectiveness of prevention strategies based on CDC's recommendations to be implemented in elementary schools (grades K-5) in Georgia. | 1,321 | The population of interest included public elementary schools of several counties in the state of Georgia. | Cross-sectional Study | Georgia schools that were actively taking steps to improve air quality in indoor spaces participated in a survey that asked how many students were infected with COVID-19 over the course of 26 days. 169 schools participated in the survey, and researchers examined | Before the availability of COVID-19 vaccines, incidence of COVID-19 cases were lower in schools that required mask use and/or improved ventilation by at least 30% CDC recommends schools implement | The study included a multicomponent approach to school COVID-19 prevention efforts. The study compared rates of incidence of schools that implemented prevention strategies | The positive cases of COVID-19 were self-reported by staff members, parents or guardians. Prevention strategies reported by administrators or nurses might not reflect day-to-day |

| Authors/Citation | Purpose/Objective of Study | N | Sample - Population of interest | Study Design | Study Methods | Major Finding(s) | Strengths | Limitations |
|---|---|-------|--|--|--|---|---|---|
| Morbidity and Mortality Weekly Report, vol. 70, no. 21, 2021, pp. 779–784., https://doi.org/10.15585/mmwr.mm7021e1 . | | | | | the prevention strategies used in each school, including mask requirements, social distancing, ventilation and filtration improvements, opening doors and windows, and purification. | multiple prevention strategies to reduce the incidence of SARS-CoV-2 transmission. | and those that didn't for comparison. Since the completion of this study, the author of this research article stated COVID vaccines have become widely available, which could possibly lessen the incidence rate. Research was accessible from the CDC. | activities to represent all classrooms There was limited ability to detect lower incidence rates for other less frequently used strategies. |
| Head, J. R., et. al. (2021). School closures reduced social mixing of children during COVID-19 with implications for transmission risk and school reopening policies. <i>Journal of The Royal Society Interface</i> , 18(177). https://doi.org/10.1098/rsif.2020.0970 | To estimate: social contact patterns among school-aged children during Bay Area COVID-19 related school closures, the cumulative incidence of COVID-19 throughout the 2020 spring semester under counterfactual scenarios had schools or workplaces remained open, or social distancing policies not been enacted; and estimate the effect of various school reopening strategies in Bay Area schools by grade level and across a new semester. | 1,000 | The study's population of interest were school-aged children in nine Bay Area counties. Eligible households contained at least one school-aged child (pre-kindergarten to grade 12). | A social contact survey of school-aged children within the Bay Area. | A survey was conducted to determine contact rates of children and their adult family members during spring school closures. Contact rates were used within an individual-based transmission model to examine the impact of school closures and reopening strategies. | Based on the results of the study, researchers found that if the prioritized essential elements of masks and social distancing are not met, outbreaks are more likely to occur. Implementing more than one precaution in schools can reduce the likelihood of transmission. | The study includes the use of a transmission model to evaluate how effective different strategies of reopening schools would be. The study also highlights the importance of teachers and staff who are also affected by specific precautions. | The study indicates that there may be selection bias in the survey with discrepancies observed in the number of contacts by work location and ethnicity. The sample of the study does not capture contact patterns among and between adults who do not have children, particularly missing those of young adults (18-29) or older adults (65+). |

| Authors/Citation | Purpose/Objective of Study | N | Sample - Population of interest | Study Design | Study Methods | Major Finding(s) | Strengths | Limitations |
|--|--|-------|--|----------------------------|---|--|--|---|
| Ng, Oon Tek, et al. "Impact of SARS-COV-2 Vaccination and Paediatric Age on Delta Variant Household Transmission." <i>Clinical Infectious Diseases</i> , 2022, https://doi.org/10.1093/cid/ciac219 . | To assess the impact that age and vaccination has on the rate of transmission, with emphasis on the pediatric population. | 8,470 | The population of interest included household close-contacts with children. | Retrospective Cohort Study | Data was collected through contact-tracing performed by the Ministry of Health (MOH) for every diagnosed COVID-19 case. | Vaccination had a notable impact on the rate of transmission that also differed between vaccine types. Children, especially those under 11 had a higher rate of transmission than adults. | The study contains a "data sharing statement" that ensures safety of personal information. The work of the study was supported by funds by the Singapore Ministry of Health's National Medical Research Council with additional support from Germany's Federal Ministry of Health and WHO. | The delta variant was the predominant strain during the time of this study. Presently, the Omicron variant has since replaced Delta. The sponsor(s) of this study did not have a role in the design of the study as well as the data collection and analysis. |
| Perry, Julie, et al. "Utilizing Academic-Community Partnerships with Nursing Students to Improve Hand Hygiene in Elementary Students to Reduce Transmission of COVID-19." <i>NASN School Nurse</i> , vol. 36, no. 6, 2021, pp. 333-338., https://doi.org/10.1177/1942602X20986958 | To describe a collaborative partner initiative that increases health promotion education in schools to increase knowledge on how to reduce the spread of COVID-19 and provide nursing students an opportunity to educate students on how to properly wash their hands. | 232 | Population of interest includes school staff, teachers, 2nd to 4th grade students. | Qualitative study | A team of 10 nursing students conducted a community health need-based assessment by interviewing school staff, teachers and administrators. From this point, in collaboration with nursing students, 4 teachers and supervision from nurse faculty, an HHE curriculum based on CDC handwashing guidelines was created to be implemented in the classroom. Partnership-based approach | A total of 232 students were educated using the HHE curriculum. COVID-19 demonstrated the need for an improved public health education system and urged for utilization of the role of school nurses as health resources of communities. Nursing schools are valuable partners for school nurses to support health education (HHE). | This study contained a large sample size. To ensure competency to conduct learning activities, the teaching tool was taught in two phases providing opportunity for hands-on training: nursing faculty taught initial lessons and nursing students with joint participation of staff in the next phase. | The program developed by nursing staff and students was developed prior to the pandemic The curriculum was designed based on needs of a specific community and would require further experimentation if used universally. During the time of this study, evaluating HHE may have been difficult because schools were in a virtual classroom format. |

Appendix B

Hand-Hygiene Pre/Post Test

**What I do with my hands before:**

| | | |
|--|-----|-------------|
| 1. How long do you wash your hands? | | ___ Seconds |
| 2. I wash my hands after playing with pets. | YES | NO |
| 3. I wash my hands after using the restroom. | YES | NO |
| 4. I wash my hands before I eat. | YES | NO |
| 5. I sneeze and cough into my hands. | YES | NO |

What I know about hand hygiene now:

| | | |
|--|-----|----|
| 1. You should wash your hands for at least 15-20 seconds | YES | NO |
| 2. You should wash your hands after playing with pets. | YES | NO |
| 3. You should wash your hands after using the restroom. | YES | NO |
| 4. You should wash your hands before you eat. | YES | NO |
| 5. I sneeze and cough into my hands. | YES | NO |

Mask-Wearing & Social Distancing Pre/Post Test



True or False?

- 1) When you wear a mask you have to cover your nose and mouth.
 - True
 - False
- 2) Do not let your mask hang around your neck, on one ear or pull down to your chin to talk.
 - True
 - False
- 3) I wash my hands or use sanitizer when I am ready to take off my mask and fold it in half like a taco.
 - True
 - False
- 4) I should change my mask when: it gets moist, dirty or damaged.
 - True
 - False
- 5) I wear my mask indoors when I am closer than 6 feet to someone.
 - True
 - False
- 6) If my friend is more than 6 feet away from me, I do not need to wear my mask outdoors.
 - True
 - False
- 7) I wear my mask to protect myself and others from COVID-19.
 - True
 - False
- 8) It is okay to go to school while I am sick.
 - True
 - False

Appendix C

Content Outline and Class Activities: Safe Practices for Preventing the Spread of COVID-19

Objective:

- 1) Students will understand the importance of safe practices for preventing the spread of COVID-19
- 2) Students will be able to: recite when to perform safe practices such as when to wash their hands or when to wear their mask.
- 3) Students will be able to understand how COVID-19 spreads.

Hand Hygiene:

- 1) Perform pretest
- 2) Present information about COVID-19 and effective measures to prevent them.
 - a) COVID-19 mode of transmission is respiratory droplet and/or aerosol particles suspended in the air.
 - b) Exposure to the virus can occur through: breathing in air contaminated by fine droplets and particles carrying the virus from an infected person, droplets or particles containing the virus falling onto exposed mucus membranes; which include our eyes, nose or mouth, through sprays from a sneeze or cough, and touching our mucous membranes with soiled hands or after touching contaminated surfaces.
 - c) Transmission risk is significantly increased when an individual is within three to six feet of a source of infection
- 3) Perform demonstration with glitterbug hand lotion and UV flashlight
 - a) Allow students to try glitterbug lotion that allows them to see if any germs are on their hands under UV light
 - b) Teach how to wash your hands for at least 20 seconds
 - c) Each student performs hand hygiene with guidance from the nursing researcher or nursing student and evaluates their hand hygiene using the glitterbug lotion and UV light once more.
- 4) Perform a post test.

Mask-wearing & Social Distancing:

- 1) Perform pretest

- 2) Present information about masks and social distancing
 - a) When to wear it, why we wear it, how we wear it, and which is appropriate for school-aged children. (Show what different masks look like)
- 3) Bubble blowing activity
 - a) While the child is wearing a mask, ask them to blow through the stick.
 - b) If they are able to blow a bubble, this means air is able to pass through the mask and may not be the most effective in protecting the child.
- 4) Bottle Spray demonstration
 - a) Teaches about containing coughs and sneezes
 - i) Spray inside of the mask with a spray bottle, which is a good way to compare what happens with or without a mask.
 - ii) Spray bottle also shows how far respiratory droplets can reach (acts as a sneeze)
- 5) Activities that promote social distancing: create an “All About Me” poster to share amongst the class for students to make or fill out as a way to promote socialization all while maintaining safe distance.
- 6) Perform post test