

5-1-2020

## The Implementation of a Respiratory Syncytial Virus Prevention and Awareness Pamphlet in the Daycare Setting

Kaylie Marie Humphreys

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<http://dx.doi.org/10.34917/19412092>

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THE IMPLEMENTATION OF A RESPIRATORY SYNCYTIAL VIRUS PREVENTION AND  
AWARENESS PAMPHLET IN THE DAYCARE SETTING

By

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A doctoral project submitted in partial fulfillment  
of the requirements for the

Doctor of Nursing Practice

School of Nursing  
Division of Health Sciences  
The Graduate College

University of Nevada, Las Vegas  
May 2020

**Dissertation Approval**

The Graduate College  
The University of Nevada, Las Vegas

April 8<sup>th</sup>, 2020

This dissertation prepared by

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entitled

The Implementation of a Respiratory Syncytial Virus Prevention and Awareness  
Pamphlet in the Daycare Setting

is approved in partial fulfillment of the requirements for the degree of

Doctor of Nursing Practice  
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## Abstract

Respiratory Syncytial Virus (RSV) is the number one cause of bronchiolitis in children under five years of age and regrettably the number one cause of hospitalization in the first year of life. RSV leads to over three million hospitalizations, two million outpatient visits, and 200,000 deaths in the pediatric population globally each year. While no vaccine is currently available to prevent the spread of RSV, efforts must be shown in spreading awareness of strategies utilized in infection prevention such as hand hygiene and properly covering a cough or sneeze.

This project aimed to present this education to a target population of primary caregivers of children five years of age and younger through local daycare facilities. The intervention consisted of developing an educational pamphlet regarding RSV at the fifth grade reading level and recruiting nine local expert healthcare providers to validate the tool utilizing a four-point Likert scale. Once validation was received, the pamphlet was released to three local daycare facilities, and primary caregivers were asked to review this pamphlet also utilizing a four-point Likert scale through an attached survey. Survey results concluded that this pamphlet was a valuable tool of information that promoted awareness of RSV and led to parents being highly likely to implement the disease prevention strategies included. Overall, the utilization of a health promotion and disease prevention pamphlet regarding RSV was a successful intervention tool for primary caregivers of children five years of age and younger.

**Keywords:** Respiratory Syncytial Virus, infection prevention, education, pamphlet

## Acknowledgements

A special acknowledgement goes to the members of my committee Dr. Doolen, Dr. Lelund, Dr. Coughenour for their mentorship, guidance and overall encouragement throughout the process of the project. Thank you to the entire staff and faculty of the UNLV School of Nursing for allowing me the opportunity to grow in this profession and pursue a project that I feel passionate about. The persistent support, collaboration, organization, and leadership of this program allows a student like me to become successful and make a difference in our community. Additional thanks to all of the participating daycare facilities that allowed me to come in and educate the parents through this project. To all of the nurses, nurse practitioners, physician assistants, and pediatricians who took the time to valid this educational tool and provide feedback, your effort is greatly appreciated and the final product reflects this.

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## Chapter I

### Introduction

Respiratory Syncytial Virus (RSV) is the most common cause of bronchiolitis in children under five years old and a serious cause of hospitalization even in industrialized countries (Sanchez-Luna, Elola, Fernandez-Perez, Bernal, & Lopez-Pineda, 2016). This virus is the number one cause of hospitalization among infants during the first twelve months of life and regrettably leads to over three million hospitalizations, two million outpatient visits, and 200,000 deaths in the pediatric population globally each year (Heikennan, Ojala, & Waris, 2017; Rose, Wheatley, Langly, Gerber, & Haynes, 2018). In the United States (U.S.), the median cost per patient emergency department (ED) visit is almost nine thousand dollars. If the viral infection is severe enough to be admitted to the Pediatric Intensive Care Unit (PICU), costs per patient intensify to over \$120,000 (Fine, Bray-Aschenbrenner, Williams, Buchanan, & Werner 2019). With over three million RSV hospitalizations per year, it is estimated that \$1.73 billion is spent on bronchiolitis admissions each year (Heikennan, et al, 2017). Decreasing the spread of RSV can prevent poor health outcomes in our pediatric population and relieve social and associated financial costs. Because contracting this virus is completely preventable, additional focus is necessary to educate parents, caregivers, and daycare employees on how to prevent the spread of RSV.

Caregivers of children under five years of age play a vital role in maintaining and promoting healthy habits such as hand hygiene and how to properly cover coughs and sneezes. These infection prevention habits are the most effective ways to prevent the spread of RSV as it is primarily transferred through close contact with sick individuals and infected objects and surfaces (Di Carlo, et al., 2016). Providing education to parents and caregivers, who will then



teach their children on ways to avoid spreading infections may result in decreased occurrence of RSV.

### **Problem Statement**

There is a lack of education regarding the prevention of RSV in caregivers and daycare employees who play a vital role in health promotion and disease prevention in children under five years old (Miller, 2010). Thus, the lack of adequate RSV prevention measures is contributing to RSV infection rates (Sanchez-Luna, et al., 2016).

### **Significance of the Problem**

Worldwide, acute bronchiolitis due to RSV has led to longer hospitalizations and a smaller threshold for intensive care unit (ICU) admission than any other infectious cause of bronchiolitis (Sanchez-Luna, et al., 2016). When studying the trends of RSV infection rates from 2004 to 2012, Sanchez-Luna et al. (2016) not only discovered that the rates of infection had not experienced a significant reduction, but that there was an increased risk for mortality during RSV hospitalizations. While risk factors including premature birth, bronchopulmonary dysplasia, congenital heart disease, and Down syndrome significantly increase rates of mortality and prolonged morbidity, RSV infections also have extremely poor outcomes for full-term, previously healthy children (Atwell, Geoghegan, Karron, & Polack, 2016). Complications from RSV may cause severe respiratory distress, tachypnea, tachycardia, hypoxia, and even require mechanical ventilation (Atwell, et al., 2016).

In addition to negative and sometimes severe health outcomes for the infected pediatric patient, the duration of an illness has a direct effect on the primary caregivers in the home. Unexpected familial sickness leads to caregiver burnout, especially when multiple members of the family transfer the virus to one another. For RSV infected children under three years of age,

the mean duration is approximately 13 days, and the mean duration of illness in children three to six years of age is seven days (Heikennan, et al., 2017). On average, parents are missing two to three days of work with every RSV infection, excluding children who are admitted to the hospital. This can cause extreme stress in the working family, and lead to a disruption of caregiving balance (Heikennan, et al., 2017). Adverse consequences affecting both the pediatric patient and their caregivers further show the need for furthering prevention efforts.

### **Purpose Statement**

The purpose of this doctor of nursing practice (DNP) project was to develop a health promotion and disease prevention pamphlet that aims to increase knowledge about RSV in primary caregivers of children less than five years of age and promote prevention strategies used to reduce RSV infection rates.

## Chapter II

### Review of the Literature

This review of literature included searches from the following databases: Cumulative Index of Nursing and Allied Health Literature, Embase, Scopus, and Web of Science databases. Keywords utilized in the initial search included *respiratory syncytial virus in daycare*, *educational brochure design*, *brochure readability*, *health promotion for parents*, *disease prevention education for parents*, *RSV in children*, *education and brochures*, and *brochure validity*. The combined search from all databases yielded over 500 results, with approximately 150 duplicate studies between databases. To access up to date research, the search was limited to literature from 2008 to 2019. Studies were excluded if they focused on ages older than five years or if verbal education was provided to increase knowledge about disease prevention. Studies were further narrowed down based on relevance to this project such as having studies in the English language, studies utilizing education specifically geared towards caregivers, studies ensuring the education focuses on health promotion or disease prevention, and if the studies evaluated the effectiveness of the written education. Overall, 24 studies were included in this review of the literature to discuss the relevance and practice gaps associated with this topic.

**Knowledge Deficit and Lack of Prevention Plans.** Effective prevention efforts include good hand hygiene, avoiding tobacco and large crowds, covering coughs and sneezes, breast-feeding until six months of age and remaining home from daycare until all symptoms have resolved (Miller, 2010; Ralston et al., 2014). Adequate hand hygiene practices have a long-standing reputation as an effective measure to reduce the transmission of infectious diseases. Despite hardy supporting evidence, one study noted that out of 195 parents, only 12.3% had ever been educated on its importance during family practice or pediatrician visits (Di Carlo, Romano,

Plano, Gueli, Scarlata, & Mammin, 2016). This study illustrated the lack of education in family office visits and why it is vitally important to provide education at the community level to daycare employees, parents, and other primary caregivers.

As vaccination programs for RSV have yet to be developed, prevention efforts must rely on other public health practices. Despite advancements in a vaccination for RSV, there is a Palivizumab injection that may combat RSV (Ralston, et al., 2014). This is an antibody injection that is only reserved for preterm infants less than 32 weeks of gestation with associated heart disease or chronic lung disease (Ralston, et al., 2014). Current guidelines do not recommend giving Palivizumab to the general population and therefore require other measures to prevent its spread (Ralston, et al., 2014). Unfortunately, public health initiatives specific to RSV prevention have not been properly developed and implemented (Miller, 2010). If public health initiatives are not created and utilized for the general population, RSV will continue to be the leading cause of serious viral lower respiratory tract infections in children (Miller, 2010). Research is lacking and it remains unclear as to why public health initiatives are severely underused and underdeveloped, despite detrimental effects on the pediatric population. While there is an explosive increase in approaches for vaccination efforts, researchers agree that children under five years old will benefit from an effective RSV prevention program (Domachowske, Halczyn & Bonville, 2018).

Yael Kopacz, Predeger & Kelley (2013) utilized a survey to interview six parents of children who had been hospitalized with RSV. Part of the survey asked the parents about their knowledge of RSV before and during the hospitalization. A significant need for RSV education was confirmed, as all of the parents were unaware of RSV specific signs, symptoms, and thresholds from emergency room visits such as cyanosis, tachypnea, and dangerous fevers

despite antipyretic use. A common theme among caregivers was a sense of guilt for not recognizing the illness earlier and the possibility of different outcomes if they had come to the hospital sooner. When parents were asked about their knowledge related to RSV before and during the hospitalization, one participant stated that because the information coming from the providers was new knowledge for them and was provided during a stressful event, they were not confident in their ability to retain the information (Yael Kopacz, et al., 2013). This demonstrates the importance in ensuring primary caregivers not only have the education to prevent the onset of RSV, but that they also need to have written educational materials that will outlast a verbal conversation provided during a traumatic hospitalization. The key takeaway from this study is to understand how crucial it is to promote education to parents before a devastating hospitalization occurs.

Miller (2010) states that in order to bridge the gap of vaccination efforts, education on effective RSV prevention strategies is the primary and most crucial step to be taken to decrease poor health outcomes. Clinical practice guidelines from the American Academy of Pediatrics strongly recommend anyone in contact with those exhibiting symptoms of RSV to decontaminate their hands using alcohol-based rubs (Ralston et al., 2014). The World Health Organization states that the use of alcohol-based rubs for hand hygiene is preferred over washing with soap and water because alcohol-based rubs are more effective in removing organisms, are less irritating to this skin and demand less time to implement (Ralston et al., 2014). While there is significant evidence on the efficacy of prevention efforts for RSV, there is a large deficit in research stating how to take these evidence-based results and integrate them into an educational tool for primary caregivers to utilize. Ralston et al. (2014) states that educating caregivers on the prevalence and prevention of RSV may make a significant difference on parent's care patterns. Without proper

RSV prevention plans, the dangerous knowledge gap in how to prevent its spread will ultimately lead to increases in mortality and morbidity rates for this vulnerable population group.

The Centers for Disease Control's (CDC) website does include a free downloadable handout that healthcare providers may dispense to their patients (CDC, 2018). The handout includes images associated with short sentences on ways to protect children from RSV (CDC, 2018). This educational sheet includes evidence-based prevention efforts such as avoiding close contact with sick people, washing hands, covering coughs and sneezes, disinfecting surfaces, avoiding touching your face, and to stay at home when you are sick (CDC, 2018). While this handout contains great information on the prevention of RSV, it does not include vital information about what RSV is, how to recognize signs and symptoms, and what to do if they suspect their child has contracted RSV. Understanding RSV as an illness is a crucial component of preventing negative outcomes associated with its infection, and this handout is inadequate in addressing those elements.

### **Written Educational Tools for Health Promotion and Disease Prevention.**

Implementation of a health promotion and disease prevention tool for RSV will bridge research with practice for parents and caregivers of children under five years old. During primary care visits, study findings indicate that patients only retain 29-72% of verbal information provided by health professionals (Garcia, Chismark, Mosby & Day, 2010). In primary care settings, utilizing written educational materials that enhance knowledge related to health promotion and disease prevention has proven to be effective (Akkuzu, Arslantas, Kosker, & Sen, 2009). Akkuzu, et al. (2009) conducted a quantitative survey that found caregivers who are caring for the patients at home stated that written materials were satisfactory and effective at enhancing knowledge. Caregivers reported the pamphlet gave them a tool to refer to when needed. Family members in

another study on fall prevention stated the need for clear and specific examples of interventions they could implement at home. Additionally, families wanted to be educated on the advantages and disadvantages of each intervention (Schoberer, Egelseer, Halfens, & Lohrmann, 2018). This was key to our review because most parents are the primary caregivers in the home setting, and a reliable reference pamphlet is said to be very useful and answer many looming questions (Akkuzu, et al., 2009). Distributing brochures and pamphlets is effective in educating parents because they can target a specific audience, are convenient to store, are effective in communicating standardized information, and have proven to be a helpful reference outside of the healthcare setting (Garcia et al., 2010).

In order to understand how best to educate individuals regarding the care of their child, Esses, Small, Rodemann, and Hartman (2019) implemented three educational strategies to 62 caregivers whose children were in an ICU. When compared to a scripted conversation and a three-minute video, authors concluded that educational brochures were the intervention of choice leading to a successful and sustainable increase of knowledge in post-intensive care syndrome. Further benefits included that the brochure was simple, cost-effective, and required much less exertion on the educators. An educational pamphlet reduced time in educating multiple families and was more constructive than recruiting families or caregivers to watch an educational video (Esses, et al., 2019).

Dela Cruz, et al. (2017) interviewed families in Hawaii about their thoughts on how to increase Human Papillomavirus (HPV) vaccination rates with an educational brochure as the intervention. Twenty parents concluded that a brochure would be an effective reference to increasing health promotion behaviors, especially when given by a healthcare professional. Parents also stated that the brochure should address barriers, rumors, and common

misconceptions regarding the HPV vaccine to decrease fears with the evidence-based benefits (Dela Cruz, et al., 2017). Including this information into a brochure of any health promotion initiative will alleviate and correct parental anxieties and have beneficial outcomes of their perception of disease processes.

Another brochure given to parents aimed to improve the awareness of a caregiver's role in preventing postural cranial deformity in newborns during the first fifteen days of life. This brochure educated parents on daily actions that might prevent a cranial deformity from occurring. After one year of intervening with the educational brochure, not one of the children presented with signs of cranial deformity (Diez Orive, Fernandez Ezquerro, & Barrena Guijamo, 2010). The significance of this study demonstrates the large impact that a small educational brochure can have on disease prevention for its targeted population.

**Educational Tools Improve Health Literacy.** The use of educational pamphlet increases parents understanding of disease processes, lab results, and image results when compared to verbal explanations (Gebhard, Goske, Salisbury, Leopard, & Halter, 2015). Improving health literacy, especially in parents, decreases the misinterpretation of medical information and decreases stress levels in a patient-care situation. When comparing pre- and post-pamphlet examination scores regarding a child's fluoroscope examination, post-pamphlet test results increased by up to 32 percent. Increasing health literacy leads to a larger capacity for individuals to gain, comprehend, and absorb essential health information that will enable them to make beneficial health decisions (Gebhard, et al., 2015).

Cleveland (2013) discovered that there were major barriers blocking parental compliance with chronic conditions such as children's asthma. One of the most significant factors leading to individual treatment noncompliance and poor outcomes is inadequate education regarding the



condition (Cleveland, 2013). Important asthma education such as a description of the disease, the knowledge of triggers, and a description of basic symptoms were compiled into a pamphlet and distributed in a pediatric clinic. Post-education efforts led to a decrease in acute asthma visits over a two-year period. Parents responded well when given evidenced-based written education regarding this complicated disease process. The intervention ultimately led to an increase in understanding that allowed parents to provide improved care to the affected children (Cleveland, 2013).

Bester et al. (2016) evaluated the effectiveness of educational pamphlets given to healthcare professionals regarding rare adverse events that can occur in a hospital setting. A five-question survey given after the implementation of the brochure focused on screening for an increase of knowledge based off of the information presented. Survey results were compared to a control group who took the survey without reading brochure. Out of 121 surveys, 95.5% of participants who read the brochure achieved a passing grade of answering at least four out of the five questions correctly. Of those who did not read the brochure, 57.6% did not receive a passing grade on the survey. This study provides supporting evidence that targeted educational brochures are effective tools utilized to increase a reader's knowledge base (Bester, et al., 2016).

Another study investigating the effectiveness of an educational pamphlet given directly to patients struggling with shoulder pain and dysfunction found that the intervention did increase their knowledge (Burke, et al., 2018). Not only did the participants state that the brochure made the information easy to understand, 87% of the readers confirmed that a pamphlet was helpful in improving their awareness about shoulder health (Burke, et al., 2018). An important finding in this study was that every participant was open and interested in receiving educational materials and wanted to learn exercises to reduce pain and prevent further damage. This aids in confirming

that patients can be willing to learn and implement interventions to promote healthy behaviors, they simply need tools to guide them in the right direction.

While there is sufficient evidence supporting the use of written educational tools to increase knowledge, understanding and awareness of healthcare related issues, it is important to note that there is a lack of research addressing whether the target audience will read the educational tool outside of a controlled environment. Studies found in the research recruited sample participants that agreed to read the educational tool and take an associated survey. Researchers are able to measure whether the pamphlet was effective or not because the entire sample size was compliant in their participation. This is beneficial evidence, however studies that distributed pamphlets, recorded the response rate and then measured its effectiveness were not found during this review of the literature.

**Importance of Educational Pamphlet Readability.** Readability formulas are widely used to assess, guide, and evaluate written health information. It is approximated that 36% of the United States (U.S.) population understands elementary or below elementary health literacy (Wang, 2013). Because of this, the readability of the information deserves a large amount of attention during its development in order to cater to the majority of its audience. Wang (2013) also studied many of the readability formulas including Dale-Call, Flesch Reading Ease, Fog, and Simple Measure of Gobbledygook (SMOG) and found that the SMOG formula remained the most uniform and consistent. This formula was found to be simple to use and avoided complications such as word counting; a focus of other formulas (Wang, 2013). This information holds tremendous value when developing written health information in order to ensure its evaluation will meet the literacy needs of its readers.

The SMOG formula focuses on analyzing the readability of materials through polysyllabic words that are made up of three or more syllables. The formula includes a selection of ten sentences in the beginning, middle, and end of the text. Out of these 30 chosen sentences, the count of all of the polysyllabic words and the square root of that number is taken, then three is added. The resulting number is the approximate grade level that would be required for the reader to understand the text. While there is room for subjectivity based on which 30 sentences the evaluator selects, this tool remains in the top contenders for reliability and consistency (Seitz, 2017). The U.S. National Cancer Institute endorses the use of the SMOG formula and states that it would highly recommend using this tool to evaluate the readability of pamphlets (Seitz, 2017).

Developing a customized pamphlet that captures key educational elements in an easy-to-read manner is crucial for improving health promotion and literacy. As a reference, the American Medical Association (AMA) and National Institutes of Health (NIH) advises that all written educational materials need to be written at the fourth to sixth-grade reading level (John, et al., 2016). Helitzer, et al. (2009) discovered that the mean reading level of 69 educational brochures regarding cervical cancer screening was the 11<sup>th</sup> grade level. This mean reading level is much too high for the average audience and decreases the comprehensibility for the majority of its readers. Similarly, another study on dermatology information found that out of 260 written patient education materials, 65.8 percent were written above the tenth-grade reading level with an average reading level at 11<sup>th</sup>-grade (John, John, Hansberry, & Lambart, 2016). Not one patient education material analyzed during this study was found to be within the recommended reading level, informing the designers of the materials that re-editing needs to take place to ensure that patients would be able to benefit from them (John, et al., 2016).

An even larger study analyzing 540 written materials also noted a mean reading level of the 11<sup>th</sup> grade (Hansberry, et al., 2017). This was significant because it included materials from allergy and immunology, cardiology, endocrinology, gastroenterology, geriatrics, hematology, hospice and palliative, infectious disease, nephrology, oncology, pulmonology and critical care, rheumatology, sleep medicine, and sports medicine. The infectious disease material was found to be the most difficult to understand as it was noted to have a 13<sup>th</sup>-grade reading level, and the easiest material was the sleep medicine which was written at the 8<sup>th</sup>-grade reading level. Again, not one piece of material was found to be at the level that the AMA and NIH guidelines recommend. This widespread education review provides information that there is a problem with the readability of the education materials regardless of the subject and that it needs to be corrected.

In order to increase the comprehensibility of written health information, Garcia et al. (2010) found that picture-based materials were beneficial, especially in circumstances when the targeted audience is found to have low-literacy levels. Because high readability levels are proven to hinder the perceived benefits of educational brochures, incorporating image-based instructions would be an important factor to consider when the goal is to offset complicated health prevention or promotion efforts. This would eliminate the use of complex terms that are sometimes necessary to ensure that the health information displayed is accurate and evidence-based.

**Significance of Educational Pamphlet Design.** A well-designed educational pamphlet is crucial to successfully increase knowledge of health prevention and promotion regarding RSV. Careful thought needs to be integrated into planning the background color, font, readability, imagery, and the overall content to be displayed. Morgaine (2015) developed a brochure regarding the importance of oral health and used seven focus groups to critique or recommend

improvements before it was published. Results began with positive feedback concerning the use of pictures to help the reader understand the content being described. The focus groups also indicated the importance of designing images large enough to view, but not overwhelm the page. Pictures add interest to the content. Other recommendations were to utilize bright and more realistic photos and to avoid the color red. Controversy broke out in the group as they discussed the pros and cons of utilizing disturbing clinical images of severe dental disease. Some stated the pictures were so difficult to look at they wanted to ignore them; while others thought it was necessary to prevent dental disease. The compromise came as the focus groups agreed to include pictures of mild dental disease that would motivate, but not turn eyes away from recognizing the serious consequences of dental disease (Morgaine, 2015).

Headings, background color, and brochure size were among other components that were discussed. When compared to pink, greens, yellow, and purple, focus groups confirmed that a graduated blue color was attention drawing, clean, and classy. The graduated gradient of blue led the eyes downward following the text and the groups expressed that the brochure looked more professional. The text written in black was an appropriate contrast to the background and acceptable readability. The focus of bolded headings kept the text content organized and led the reader to the key points. Lastly, the seven focus groups were given three sizes of brochures: A4 page, an A4 page folded to A5, and then an A4 DLE three-fold layout. Overall, it was voted to utilize a three-fold pamphlet design because it was the smallest and most convenient to store and would take up the least amount of space on a stand. Health information can be overwhelming, so a simple title and image on the first page of the pamphlet will suffice. Readers will be drawn to the brochure if they are interested in the topic but they might not be willing to spend time deciphering what the pamphlet is about if the title page is over complicated (Morgaine, 2015).

Another study implemented a theory-based pamphlet design that aimed at increasing the amount of knowledge retained through specific strategies also involving text and illustrations (Whittingham, Ruiter, Castermans, Huiberts & Kok, 2008). This study begins with stressing the importance of text comprehension and text coherence. Text comprehension is essentially when the information is successfully transcribed into the reader's knowledge base. Text coherence is when the structure of the text is consistently organized and flows in a logical manner. Text comprehension is achieved when the readers link together new information with their own prior knowledge. The specific connection transitions the information from the working memory to the long-term memory where it is stored for the reader's use. Text coherence is subdivided into the macro and micro-levels. The headings of the text can be used for macro-level coherence if they guide the reader in an easily followed manner. Micro-level coherence is when there are connections within the paragraph that pilot the reader from one sentence to the next. This is achieved by using the information in the previous sentence to begin the new sentence and ultimately it elicits a knowledge-building flow (Whittingham, et al., 2008).

Whittingham, et al. (2008) also discusses the use of the dual code theory, which states that readers use verbal and visual cognitive subsystems in the brain that process written information. In order for connections to be made between these two subsystems, the text and images need to be in the working memory at the same time. Dual code theory suggests that when this processing occurs, there is an increase in the probability that the information will be recognized and recalled. This theory is applied in a pamphlet by clearly referencing or mentioning the illustration in the text. To further grab the attention of the readers, it is important to include parts of the text that stand out. This study confirms that when readers are scanning a brochure, items that are different in color, shape, or texture immediately draw the reader's

attention. Specifically, the headings of the brochure should not match the rest of the presentation in order to grasp the attention of the reader and therefore have the information be committed to memory (Whittingham et al., 2008).

Overall, Whittingham et al. (2008) found that when applying the Dual Code theory components to improve an alcohol cessation brochure, there is a significant increase in knowledge uptake when compared to the unmodified brochure. Both Whittingham et al. and Morgaine (2015) agreed on the importance of incorporating both text and pictures into the pamphlet design in order to maximize the impact of the educational content. Another similarity between both studies is the specific impression that headings made on the flow and attention-grabbing aspect of the design. Both Whittingham et al., and Morgaine (2015) stated that the focus groups were attracted to bolded headings that stand out and differentiate content. Incorporating these design elements in health education brochures will promote knowledge retention, and ultimately produce effective learning due to the pamphlet (Morgaine, 2015).

**Summary.** While there is significant evidence supporting behaviors to effectively prevent RSV, little research has been done about the utilization of RSV prevention plans in reducing its infection rates. Miller (2010) revealed the most effective ways in preventing its spread, such as hand washing. However, Yael, Kopacs, Predeger & Kelley (2013) found that parents are not only unable to convey how to prevent RSV, but are also unable to state how to recognize symptoms that would require hospitalization. Using a health promotion and disease prevention pamphlet has been found to increase health literacy and also retention of knowledge (Gebhard, et al., 2015). The use of the SMOG formula has proven to be effective in breaking the barriers for brochure readability by allowing health information developers to create written information that can be understood at the recommended reading levels (Seitz, 2017). Integrating

proper brochure design techniques allows the reader to follow along without losing interest, grasp key concepts, and increase their knowledge on the information provided (Whittingham, et al., 2008).

### **Needs Assessment**

Large gaps discussed in the review of literature exposed the need for ongoing education regarding the prevention of RSV and the impact that an evidence based pamphlet may have on filling this gap. Parents with children five years of age and younger are not aware of RSV or the potential harm that this virus can have on their child's health (Yael, 2013). Unfortunately, a hospitalization with RSV induced bronchiolitis may have to occur for the education to finally reach families (Yael, 2013). When caregivers do not understand RSV as an illness, they will not understand the strategies recommended for its prevention. Over 75% of parents had never been educated on the importance of hand hygiene, which is the number one way to prevent RSV (Di Carlo, et al., 2016). Without a vaccine available to the general public for the prevention of RSV, it is imperative to educate primary caregivers on prevention strategies that should be implemented into their child's environment. Researchers involved with developing an RSV vaccination agree that an RSV prevention plan needs to be in place for this population, however, there is a lack of research directed at the prevention program's effectiveness (Domachowske, et al., 2018). This information remains consistent with the findings in the review of the literature and confirms the need for an educational tool for primary caregivers of children to utilize and reference.

### **Population Identification**

Specifically, this project was geared towards individuals residing in Reno, Nevada who participate in the role of primary caregiver to children under five years old. This included



biological parents, legal guardians, caregivers, and daycare or preschool employees entrusted with caring for children in this age group. Children remain dependent on their caregivers for guidance and instruction. It is crucial to educate this population will be crucial to educate, as they will be the frontline implementers and mentors for disease prevention habits. Increasing the knowledge of caregivers through the implementation of an educational brochure will improve their knowledge about the virus, provide health promotion and disease prevention strategies, decrease fear and anxiety, and hopefully lead to a decrease in infection rates in the community (Akkuzu, et al., 2009; Gebhard, et al., 2015; Miller, 2010; Whittingham, et al., 2008).

### **Key Stakeholders**

Key stakeholders who were involved and invested in the outcome of this project will include both internal and external groups. Internal stakeholders were parents and caregivers of children in daycare and preschool, daycare employees, pediatricians, and pediatric registered nurses. External stakeholders were the owners of local daycares and preschools, pediatrician office staff, the three hospitals in Reno, Nevada that serve pediatrics, and the overall community of Reno, Nevada.

### **Assessment of Available Resources**

Resources required for the successful development of this project was a computer with brochure designing software such as Microsoft Word, high quality printing materials or access to professional printing offices, standard office supplies, and time. Samples of the brochure will be printed using a local professional printing shop in order to produce a high quality and professional educational tool. Internal stakeholders used for brochure validity will be allocated time to review and grade the brochure. This author did not need a meeting place for this evaluation to occur as this was done on his or her own time and convenience. After analyzing the

required materials and resources needed for this design during the planning phase of this project, it was determined that this project acquired feasible resources for its implementation.

### **Scope of Project**

The scope of this project aimed to create a well-designed evidence based pamphlet that informs families and caregivers of children five years old the risks associated with RSV and strategies to prevent the spread at home, daycare, or preschool facilities. This project aimed to create and pilot a tool, specifically designed for primary caregivers, that focuses on health promotion and disease prevention strategies to reduce rates of RSV infection.

### **Project Goals**

The overarching goal of this project was to create a pamphlet that created awareness of the serious impact that RSV can have on children and to provide primary caregivers with education on recognizing early symptoms of RSV to prevent the illness from occurring altogether. Ideally, as a distant goal, this increase in education on RSV might have a significant impact on the community and lead to a decrease in RSV infection rates. The primary goal when designing this evidence based pamphlet was to create a final product that will be verified by local experts, is easy to read for all audiences at a fourth to sixth grade reading level, highlighted important facts regarding the virus, and provided clear, evidence based and useful instructions on steps the reader can take to prevent this virus from having negative impacts on their children. These ambitions had the potential to achieve significantly positive outcomes for local families, the community, and ultimately our healthcare system as a whole.

## Chapter III

### Theoretical Underpinning

This DNP project was based on Imogene King's Theory of Goal Attainment (TGA). This theory provides a holistic approach to patient care and aims to enhance communication to achieve mutually agreed upon goals (Alligood, 2010). Applying King's TGA to this project promoted an understanding of family-centered care, facilitated communication from the healthcare provider to the target population, and coordinated strategies for attaining health promotion and disease prevention goals.

**King's Conceptual System.** King's TGA is founded on a conceptual system that King previously developed. The hallmark of King's system, as applied to this project, states that familial units are reactive, goal-oriented, and interact constantly with the environment (King, 1992). Families are also open-systems that create goals based on their values, culture, motivations, and needs (King, 1992). Establishing goals to prevent RSV will allow families to integrate health-promoting behaviors as they interact with the environment. It is imperative to integrate this theory into the implementation of this pamphlet in order to achieve a mutual goal of learning RSV prevention strategies.

There are three main components to King's conceptual system, personal, interpersonal, and social systems (Table 1). The personal system explains how human beings process individual experiences through their senses. If families are unaware of the risks and consequences of RSV because of a lack of personal experience and knowledge exposure, they will be unable to perceive the threat that that RSV has on their child. By promoting the "learning" component of this system, this pamphlet will provide an evidence-based "perception" of the virus. Caregivers will then be cognizant of signs and symptoms to monitor for, learn how

it is contracted, and why it can be dangerous. The interpersonal system utilizes interactive processes from two or more individuals that aim to mutually set and achieve goals. As education regarding the prevention of RSV is not being provided to families during provider office visits, this exposes a large deficit within this system (Di Carlo, et al., 2016). In order to bridge this gap within the interpersonal system, a mutual goal of increasing knowledge on RSV prevention efforts will be set. The use of an educational pamphlet that empowers caregivers will aim to achieve this goal through the implementation of written “communication”. As caregivers understand their “role” in preventing this illness, they will become prepared to take the necessary steps to integrate these practices in their home. Social systems are the framework that defines relationship types established by human beings. Daycare centers and preschools are the communal settings where children and employees spread illnesses back and forth from one another (Capitulo, 2017). In order for this pamphlet to have an impact on the incidence of RSV within social systems such as daycares, preschools, and communities nationwide, successful education transactions must be distributed to various settings of the targeted population. By directing education not only to individual caregivers but also to organizations such as facilities housing hundreds of children less than five years old, successful health promotion and disease prevention efforts will create a snowball effect throughout the community. As the momentum of this snowball effect increases, communities throughout the nation will not only have an increased awareness of RSV, but will also understand how to prevent it. “Power” against this illness will be placed back into the hands of the families and generate a sense of “control” over preventing RSV from attacking their community.

Table 1

*Components of King's Conceptual System*

| Personal             | Interpersonal | Social          |
|----------------------|---------------|-----------------|
| Perception           | Interaction   | Authority       |
| Self                 | Communication | Power           |
| Growth & Development | Transaction   | Organization    |
| Body Image           | Role          | Control         |
| Time                 | Stress        | Status          |
| Personal Space       | Coping        | Decision-making |
| Learning             |               |                 |

The systems approach focuses on basic human communication designed to guide the provider into properly caring for individuals, families, small groups, and social systems (Alligood, 2010). Promoting basic human communication through an educational pamphlet will capitalize on the interactions within the systems. Since the concepts within the three systems are structured to be open and non-linear, it implies that the provider may freely go back and forth to each system as needed in order to continue to understand the patient or population (Caceres, 2015). Piloting this intervention within a sample derived from the target population promotes system movement by receiving feedback rating the pamphlet's effectiveness. It is crucial for providers in healthcare to understand all three systems in King's conceptual model in order to collaborate with clients to meet their needs and achieve their goals.

In summary, this project targeted the personal and interpersonal systems with the educational pamphlet in order to make an impact on decreasing RSV infection rates in social systems such as daycares, preschools, and communities. This occurred initially by educating individuals to promote growth and development in their knowledge of RSV using the personal system. The interpersonal system supported communication by listing strategies in the pamphlet

that prevent RSV from occurring. This allowed caregivers to acknowledge their role in disease prevention. Lastly, primary caregivers learned how to take control of infection prevention strategies, improve their decision-making abilities by increasing their knowledge and implement behaviors that prevent RSV. Through these transactions, the social system will hopefully be impacted by a decrease in RSV infection rates nationwide.

**King's Theory of Goal Attainment.** As King began to introduce this theory, she defined nursing as “a process of human interactions between nurse and client whereby each perceives the other and the situation; and through communication, they set goals, explore means, and agree on means to achieve goals” (King, 1981, p. 149). King's TGA presents the concepts of interaction, perception, communication, transaction, self, role, stress, growth and development, time, and space as the key concepts that are taken from her systems approach. It is important to note that interaction can be represented by verbal and non-verbal behaviors that involve perception and communication. Perception can be influenced by society, time, and the environment and involves processing and interpreting received data. Communication is the exchange of information through individuals who are actively participating in the transaction. Through transactions, individuals may exchange their values and therefore promote mutual goal setting. Growth and development are also essential to life as they are the continual changes at the behavioral level that guides individuals into feeling accomplished (da Silva & Ferreira, 2016).

It is through these concepts and definitions that King discussed relational propositions that represent and summarize the TGA. The process of this project will capitalize on these concepts and propositions by creating interaction through the implementation of the educational pamphlet. As primary caregivers read through the information provided, a successful transaction will occur when the reader recognizes the significance of RSV. Outlining specific behavioral

modifications within the pamphlet gives caregivers the opportunity to implement behavioral changes that lead to preventing RSV within their environment. By targeting education through the personal and interpersonal systems using this theory, this project's goal is to expand its effectiveness beginning with decreasing RSV in homes, daycares, preschools, communities, and so on. Increasing knowledge in primary caregivers will provide the tools necessary for implementing health promotion strategies in their everyday environments.

**Relation to the Nursing Process.** King's TGA is aligned with the nursing process. The concepts of perception, judgment, action, and reaction symbolize the Assessment phase of the nursing process. The assessment phase of this project identified a lack of education regarding RSV in primary caregivers and discovered the research proving its harmful consequences. King defines the Diagnosis phase as identifying a disturbance within the population. This project's Diagnosis phase exposed a large gap in knowledge for caregivers with children under five years old in the setting of daycare and preschool facilities. By diagnosing this disturbance, the provider and population can establish mutual goals and the means in which to achieve the goals during the Planning phase. By acquiring clinical evidence supporting the positive impact that an educational pamphlet may have on increasing the knowledge of its readers, it was acknowledged that implementing this pamphlet to a sample of primary caregivers would be a feasible intervention that hopefully would result in the best outcome.

When initiating the Implementation phase, the TGA stresses the importance of accountability. This will be upheld by the involvement of local experts in the field who will review the pamphlet prior to implementation ensuring its validity. After integrating the suggestions of the experts, the educational pamphlet will be released to the sample population. Lastly, the Evaluation phase will determine if the mutually agreed upon goals were met. By

reviewing the post-intervention survey, it will be determined if the primary caregivers identified the pamphlet as effective and valuable. If these goals were not achieved, the nurse and patient may identify barriers that prevented the attainment and ultimately formulate a new plan (Alligood, 2010).

Piloting this educational pamphlet based on the design of this theory and the nursing process will encourage continual intervention enhancements. Evaluation of this intervention by local experts in the field will lead to the integration of necessary modifications aimed at increasing the impact that it has on primary caregivers. Having the pamphlet evaluated by experts, implemented into the community, and then re-evaluated by the primary caregivers themselves coincides with King's process of the nurse being able to back and forth through each system to ensure goals are being met.

**Application to Family Nursing.** When providing care to children, it is essential to understand the family as a unit. In order to provide substantial care, the provider needs to determine the foci of care and then use the concepts from the personal, interpersonal, and social systems to design a successful care plan (Alligood, 2010). Focusing on the interpersonal system allows the nurse to use communication to guide the family into transactions. Successful transactions require the nurse to understand the family's perception of the interactions, identify their core familial values, and recognize the defined role of each family member (Alligood, 2010). This will be measured through the post-intervention survey given to families after reading the educational pamphlet.

As familial situations may be very complex and variant, King states that the use of this theory will allow nurses to help families maintain their health and provide them with the proper tools they need to cope with an illness. Each system and concept is designed to inform the nurse



about the family, promote communication throughout the implementation process, and facilitate the progression towards goal achievement. The pledge of this theory to be utilized for this project is to provide useful and appropriate information regarding RSV to families that will enable them to set goals, overcome problems, and make informed decisions that will promote healthy lifestyles (Alligood, 2010).

**Summary.** King's Theory of Goal Attainment served as the theoretical underpinning for this project. King understood the importance of familial nursing and designed this theory to help families achieve their goals of health. Utilizing this theory will promoted a pamphlet design that met the needs of the families in the community as determined by the gap in knowledge regarding RSV prevention in children under five years old. Enhancing communication between providers and patients is one of the hallmarks of King's TGA, and utilizing this pamphlet acted as a communication bridge to reach parents with young children. Creating a successful transaction between providers and parents led to attaining the goal of health promotion and disease prevention in the community. Implementing this theory into this project ensured that all three of King's conceptual systems will be integrated into the design of the educational pamphlet and promote holistic nursing for the targeted population.

## Chapter IV

### Project Plan

**Setting, Personnel and Resources.** The setting for the development of the project was the Northern Nevada community serving eleven pediatric medical groups. These medical groups include pediatricians, pediatric nurse practitioners, and family nurse practitioners. There are thirteen family medical groups in the area that employ three to 68 providers per medical group. These groups are comprised of physicians, family nurse practitioners, and physicians' assistants. Nine experts were chosen from these local medical groups to rate the validity of the pamphlet in order to keep the evaluation focused but accurate (Lynn, 1985). Selection criteria was based on those providers who are invited and willing to rate the brochure, those with over five years of experience in pediatric or family care, and those who provide primary pediatric care for parents of children under five.

For the implementation of the educational pamphlet as a pilot study, a goal of 24 to 32 primary caregivers of children under five years old evaluated this tool (Johanson & Brooks, 2010). There are over 80 preschools and daycare facilities in the Reno-Sparks community. Samples of the educational pamphlet were provided at the facility for the parents to evaluate (Appendix C). Resources required for the implementation of the project included standard office materials such as a laptop, printer, paper and printing cost. Lucidpress design software on a laptop computer was utilized to design and construct the brochure in preparation for its implementation (Willenborg, 2017).

**Population of Interest.** The population of interest for this project was primary caregivers of children five years old and under. This included, but was not limited to, biological parents, adoptive parents, grandparents, or other individuals who are primary caregivers for a child five

years of age and under. As previously discussed, primary caregivers within three local daycare facilities utilized the educational information presented in this brochure (Appendix D). The goal was to promote caregiver's knowledge to implement the learned health promotion and disease prevention habits, recognize the signs and symptoms of RSV, and understand the impact the virus can have on their child.

**Measurement Instruments.** Two measurement instruments were utilized to determine the readability and validity of this educational brochure. The SMOG formula focuses on analyzing the readability of materials through polysyllabic words that are made up of three or more syllables. The formula selects ten sentences in the beginning, middle, and end of the text. Out of these 30 selected sentences, the formula counts all polysyllabic words and calculates the square root of that number, followed by the addition of three. The resulting number is the approximate grade level that would be required for the reader to understand the text. While there is room for subjectivity determined by which of the 30 sentences the evaluator selects, this tool remains in the top contenders for determining readability. The U.S. National Cancer Institute endorses the use of the SMOG formula and states that it would highly recommend using this tool to evaluate the readability of pamphlets in order to keep the reading level between the fourth and sixth grade (Seitz, 2017).

The content validity index (CVI) was applied to quantify the results from a survey given to experts in the field to determine if the brochure proves to be valid. Lynn (1986) states that five to ten experts should be chosen to rate a brochure using this index to maintain tight control on the development of the instrument. The experts received a content validity form to rate specific items on the pamphlet using a four-point Likert scale (Appendix A). One survey was hand delivered to each individual expert who had one week to review the pamphlet and complete the

survey. Items on the survey assessed for item content, style, usefulness, and comprehensiveness on the brochure. A score of one for content is not representative, while a score of two showed that major revisions are needed for items to become representative. A score of three indicates the item needed of minor revisions and a score of four indicated that the information was representative. Scores of threes and fours were indicative of content validity. A CVI score is calculated based on the percentage of items that were rated either a three or a four. A new instrument will need to have a minimum CVI score of 0.80 after averaging all of the responses to establish content validity (Garcia, et. al., 2010). In order to incorporate changes recommended by the experts, a comment section was included at the end of the survey. Modifications to items were based on the review by the experts and were integrated into the pamphlet prior to its distribution to the caregivers.

A third survey tool evaluating the pamphlet was administered to caregivers of children five years old and younger. The pamphlets and attached surveys were hand delivered to three local daycare and preschool facilities in the Northern Nevada community for a total of 76 distributed surveys divided into the number of children enrolled at each location. Communication with each location's owner or business manager took place in order to customize how to effectively disperse the surveys to the caregivers within their system. Surveys were picked up at the facilities one week after the drop-off date and response rates from each location were recorded in order to monitor the goal of 24-30 returned surveys. A four-question survey assessed the overall effectiveness of the educational tool. The evaluators had the choice to fill-out an attached paper survey, or scan the Quick Response (QR) code that was printed on the paper survey with their smartphone; the QR code took them to the survey's web-based link created on Survey Monkey. The first two questions measured the reader's level of information

comprehension and self-perceived increase in knowledge regarding RSV. The two subsequent questions determined how likely the caregivers are to implement the disease prevention strategies provided and if they have found the information in the pamphlet to be valuable (Appendix B). The Likert scale was utilized for the caregivers to rate their response on a scale from one to four with scores of a three or four indicating acceptable pamphlet effectiveness. In the first two questions, a score of one or two resembled that the pamphlet was not effective or slightly effective in increasing knowledge and designing the content to be easily understood by the readers, respectively. A score of three or four showed that the pamphlet was moderately or very effective in increasing knowledge and reading comprehension. For the last two questions, a score of one or two stated that they are not likely or slightly likely to implement provided strategies or view the information as valuable. A score of three or four meant caregivers were moderately or very likely implement change and perceive the pamphlet as valuable. If 80 percent or more of the survey questions received an average score of a three or four, the pamphlet was deemed effective in achieving project goals.

**Timeline.** The timeline of the DNP project will span from June 2019 until April 2020 for a total of nine months. Details of this timeline will be outlined below.

- June 2019 – Project proposal defense
- August - November 2019 – IRB approval and design of educational tool and survey questionnaires
- January 2020 – Project implementation
- February 2019 – Evaluation of survey data
- February - March 2020 – Document analyzed data and finalize project
- March 2020 – DNP project oral defense

- April 2020 – Submit final project to the UNLV Graduate College

**Threats.** The greatest threat to this project was a lack of participation in the completion of the evaluation surveys. This threat involved both the survey given to providers to prove its validity and the survey given to the primary caregivers to prove its effectiveness. A lack of participation would inhibit further pamphlet development and decrease the impact the pamphlet has the ability to pursue. To combat this threat, discussions with chosen experts in the field were arranged in advance to determine if they would be willing to evaluate this tool. Meetings with local daycare and preschool employees and managers also took place to determine if they are interested in becoming involved in piloting the educational pamphlet. In order to increase the probability of receiving the aspired 24 returned surveys, 76 surveys were distributed throughout the community.

**Institutional Review Board Approval.** As required, this project underwent a review by the Institutional Review Board (IRB) for the University of Nevada, Las Vegas. All survey respondents, including experts in the field and primary caregivers of children under five years old, remained anonymous. Thus, this DNP project was exempt from a full IRB review (Appendix E).

**Evaluation Plan.** Increasing knowledge and awareness of RSV in primary caregivers of children through the implementation of an educational pamphlet remained the purpose of this project. Upon verifying and proving the educational pamphlet's validity utilizing the CVI measurement tool, the educational tool was piloted in the community. Data collected from surveys given to the primary caregivers after reading through the pamphlet was evaluated. Using the Likert scale to determine the educational tool's effectiveness allowed quantitative data to be obtained and measured. Information from this pilot study was utilized to improve the educational

tool and determine if the pamphlet was effective when implemented on a larger scale. Further research will consist of implementing the educational pamphlet to decrease RSV infection rates in the communities where it is implemented.

## Chapter V

### Summary of Implementation

Respiratory Syncytial Virus (RSV) is the most common cause of bronchiolitis in children under five years old and the number one cause of hospitalization during the first twelve months of life. (Sanchez-Luna, et al., 2016). Specifically, this virus causes over three million hospitalizations, two million outpatient visits, and 200,000 deaths in the pediatric population globally each year (Heikennan, Ojala, & Waris, 2017; Rose, Wheatley, Langly, Gerber, & Haynes, 2018). Contracting this virus is completely preventable and there are currently no vaccinations available to the public. Therefore, preventing RSV must focus on educating primary caregivers of families with children five years of age and younger because they participate in the role of teaching and modeling behaviors such as hand washing and covering coughs or sneezes. Decreasing the spread of RSV through infection prevention interventions will prevent poor health outcomes in pediatric and family populations.

The purpose of this project was to implement an educational pamphlet to primary caregivers of children five years of age and under in the daycare setting that would aim to increase their awareness of RSV and promote infection prevention behaviors to impede its spread. This pamphlet was first created at the recommended reading level of fourth to sixth grade levels using the SMOG formula. Nine local health care providers in the field validated the pamphlet utilizing a four-point Likert survey with an attached comment section for modifiable improvements. After implementing the recommended improvements, this pamphlet was then released to three daycares and preschools in the community. Primary caregivers of the children were then asked to participate in a voluntary four-point Likert survey to determine if the pamphlet was an effective intervention.



**Project Threats and Barriers.** The largest barrier to this project's impact was the lack of participation from the parents of the voluntary attached survey. This was due in part to the diverse methods of retrieving the survey at the three local daycares. Daycare facilities were left to their discretion on how to disperse the pamphlets and attached surveys. Facility employees were also entrusted to reinforce the instructions on when to return the completed surveys by. Recruiting daycare facilities that were invested in the success of this project greatly impacted the completed survey return rates.

## **Methods**

**Project Monitoring.** This author conducted the primary monitoring of this project with oversight monitoring by the committee chairperson. Consistent communication was maintained by this author and the owners of the three local daycare facilities before the pamphlet was released, during its implementation, and after the survey return deadline. Facility owners have remained in contact with this author for future integration of the RSV pamphlet during up and coming RSV seasons. The local expert healthcare providers in the field were also monitored for their input on this project and for future incorporation of the pamphlet in the clinic office settings.

**Data Collection.** During the design of the pamphlet, the SMOG formula was utilized to determine the reading level of the pamphlet. Ten sentences were chosen from the beginning, middle, and end of the pamphlet. Out of these 30 chosen sentences, this author counted all of the polysyllabic words and took the square root of that number, followed by the addition of three to determine the approximate grade level of the pamphlet. Pamphlet disbursement to the nine local experts in the field took place during the second week of January 2020. They were instructed to fill out and return the four-point Likert scale survey within one week either by paper for this

author to pick-up or by scanning the QR code printed on the front of the survey. Seven of the nine (77.8%) participating providers submitted their answers online and two (22.2%) providers submitted their answers on paper. The second week of January, this author incorporated the recommendations from the experts and prepared the pamphlets for their implementation in the daycare facilities. During the third week of January, the pamphlets were released into all three participating daycares. The four-point Likert survey was attached to each pamphlet with instructions stating to either turn the paper survey into a daycare employee or to submit their answers online utilizing the QR code within one week. Two daycare facilities decided to send the pamphlet and attached surveys home with the children in their daily take-home folders. One daycare facility decided to administer the pamphlet to the caregivers upon arrival to pick up their child and instruct them to fill out the survey on the spot. A total of 76 pamphlets and surveys were dispersed between the three daycare facilities. This author arrived at each facility on the fourth week of January to collect all paper-completed responses. In total, 22 completed surveys were received with a total return rate of 28.9%. Seven (31%) were completed online utilizing the QR code and 15 (68%) were turned in through the paper method (Table 2). Also of note, of the 56 pamphlets distributed utilizing the cubby method, nine (16%) surveys were returned. Out of the 20 surveys disbursed to the parents in person and on the spot, 13 (65%) surveys were returned.

Table 2

*Method of Data Collection*

| Daycares | Daycare 1 | Daycare 2 | Daycare 3 |
|----------|-----------|-----------|-----------|
| QR Code  | 2         | 5         | 0         |
| Paper    | 0         | 2         | 13        |

**Results**

**Data Analysis.** Application of the SMOG formula resulted in a 5.4<sup>th</sup> grade reading level. This coincides with the recommendations of implementing healthcare related reading materials with reading levels from fourth to fifth grade (John, et al., 2016). Receiving content validity from nine local experts resulted in perfect scores on all four four-point Likert scale questions (Table 3). A comment section was made for the providers to input any suggestions for overall improvement. These answers consisted of suggestions such as enlarging pictures, rewording the section labeled “What Will the Child Look Like” with clearer words to describe the breathing sounds, and adding the statement, “if you feel worried,” on the final page when discussing when to seek medical attention. The Content Validity Index (CVI) score was utilized to determine the validity of the pamphlet before its release into the daycare facilities. Scored responses of a three or four confirm validity, however, Garcia et al. (2010) states that the pamphlet will need to have a minimum CVI score of 0.80 after averaging all of the responses to establish content validity. The pamphlet maintained a CVI score of 1.00 on all four questions, indicating content validity for the RSV pamphlet.

An analysis of the frequencies of the Likert scores was then done on the survey given to the parents at each daycare facility. The four questions rated the pamphlet on how easy the pamphlet was to read and understand (Table 4), if the pamphlet increased their knowledge or

awareness of RSV (Table 5), how likely the parents were to implement the recommended strategies in their home (Table 6), and how valuable the information was to read (Table 7). Questions number one, three, and four all received scores of either a three or four which represents either agree, strongly agree, likely or highly likely. Question number two received two answers under a score of either a three or four. All four questions according to their calculated valid percentages maintained strong positive frequencies, meaning that according to the target population, this pamphlet is a valid educational tool.

Table 3

*Expert CVI Score of the Pamphlet (n=7)*

|                                  | Score of 3 or 4 | Score of 1 or 2 | CVI Score |
|----------------------------------|-----------------|-----------------|-----------|
| Question #1 - Usefulness         | 9               | 0               | 1.00      |
| Question #2 - Content Validity   | 9               | 0               | 1.00      |
| Question #3 - Readability        | 9               | 0               | 1.00      |
| Question #4 - Style Presentation | 9               | 0               | 1.00      |

Table 4

*Caregiver Response to the question, "This Pamphlet was Easy to Read and Understand" (n=22)*

|                | Frequency | Valid Percent |
|----------------|-----------|---------------|
| Agree          | 6         | 27.3          |
| Strongly Agree | 16        | 72.7          |
| Total          | 22        | 100           |

Table 5

*Caregiver Response to the question “This Pamphlet Has Increased My Knowledge and Awareness of RSV” (n=22)*

|                   | Frequency | Valid Percent |
|-------------------|-----------|---------------|
| Agree             | 10        | 45.5          |
| Disagree          | 1         | 4.5           |
| Strongly Agree    | 10        | 45.5          |
| Strongly Disagree | 1         | 4.5           |
| Total             | 22        | 100           |

Table 6

*Caregiver Response to the question “How Likely Are You to Use the Recommendations in the Pamphlet to Prevent RSV’s Spread” (n=22)*

|               | Frequency | Valid Percent |
|---------------|-----------|---------------|
| Highly Likely | 11        | 50.0          |
| Very Likely   | 11        | 50.0          |
| Total         | 22        | 100.0         |

Table 7

*Caregiver Response to the question “How Valuable or Useful was the Information Given in the Pamphlet” (n=22)*

|               | Frequency | Valid Percent |
|---------------|-----------|---------------|
| Highly Likely | 10        | 45.5          |
| Very Likely   | 12        | 54.5          |
| Total         | 22        | 100.0         |

**Discussion.** Analysis of the fifth grade reading level of the pamphlet achieved the project's goal of creating an educational tool at the recommended reading level for the general population. This was confirmed not only by the experts who rated the pamphlet as "easy to read" but also that all 22 primary caregivers reported that they either agreed or strongly agreed that the pamphlet was easy to understand. All nine experts also reported that the pamphlet's information was evidence-based and that the content presented was accurate. This achieved the project's goal of implementing evidence-based information to primary caregivers of children under five years of age. As a result, 90% of primary caregivers reported that their knowledge and awareness of RSV had increased after reading through the pamphlet. The most encouraging finding from the primary caregiver survey results was that all 22 of the caregivers reported being likely or very likely to implement the recommended health promotion and disease prevention strategies listed in the pamphlet. This also achieved one of the main project goals of encouraging the primary caregivers to implement infection prevention efforts in their homes so that their children will form healthy lifestyle habits. The experts lastly confirmed that this pamphlet would be very useful for primary caregivers of children five years of age and under. Primary caregivers confirmed this score by all 22 respondents stating that the pamphlet's information was either highly or very valuable to them. Implementing an educational tool that presented knowledge that would be useful and important for families to understand was another goal of this project that was ultimately attained.

Investment from the participating daycare facilities played a large role in the outcomes of this project. All three daycare facility owners were committed to following the project instructions and confirmed their understanding of the project goals. In the first two daycare facilities, this author worked directly with the facility owners who were the individuals

dispersing and collecting survey responses. In the third daycare facility, the daycare's manager was responsible for dispersing and collecting the survey responses and there was not a direct line of communication from this author to the manager. This resulted in only two responses collected from the third daycare facility and potentially displayed the need for direct communication involvement with the individuals performing the project tasks.

The resulting outcomes addressed the lack of education regarding the prevention of RSV and how the implementation of a fifth-grade reading level educational tool was successful in closing the gap for the presenting population. Addressing this gap within these three daycare facilities displays the level of implication that this educational tool may have on a larger group of the target population. This project mirrored and supported other studies that concluded that the use of an educational pamphlet increases one's understanding, awareness, and overall knowledge retention of the provided information. Therefore, utilizing this tool to successfully reach this target population provides opportunities for implications on larger scales and ultimately aims to decrease RSV infection rates altogether.

**Limitations.** While there was a previously stated goal of receiving 24 returned surveys, 22 surveys were ultimately returned. While this project was two surveys short of the project goal, the data analysis revealed that the addition of two more survey results would not have shifted the overall CVI score of the pamphlet as too high of a percentage was established to report the pamphlet as valid, regardless of what the answers would have been. This project measured through a survey if the educational tool made the respondents likely to implement the provided infection prevention strategies at home, however this project did not measure the actual change in behavior. This could be included in future projects. Overall, the pamphlet received adequate

validation from the experts and primary caregivers alike and would be an effective tool to implement to primary caregivers of children five years of age and under.

**Project Sustainability.** Further extensions of this intervention have consisted of dispersing an electronic copy of the RSV pamphlet to all of the daycare facilities that participated in this project as they have acknowledged wanting to print their own copies to release the pamphlet on a yearly basis every fall at the start of the RSV season. From the request of the expert reviewers, this educational tool will be on display at all of their offices for parents to obtain and take home. Electronic copies have also been emailed to all of the providers so that they may print them out as well. This author will encourage providers to distribute this tool to new parents when they arrive for their first appointment or to the parents of new patients that fall under the age of five. The benefit of developing written educational materials is that the information can have a lasting impact and be a source that parents may continually reference over time to improve knowledge retention (Gebhard, et al., 2015).

**Future Scholarly Activity.** An overarching goal of this project is to eventually lead to a reduction in the incidence of RSV. As displayed by this project, the success of this educational tool has the potential to improve infection prevention efforts within the daycare facilities but also in the homes of families. Since hand hygiene is the number one way to prevent the spread of RSV, improving the use of infection prevention strategies in the home will hopefully make an impact on the physical health of those applying the interventions. Targeting education within daycare facilities that house age groups at a high risk for poor outcomes will create a solid foundation of educating those primarily affected and maintains the opportunity to reach as many families as possible. Further research will need to focus on the impact of the pamphlet on actual behavior change by implementing a pre- and post-intervention survey on a larger scale with



multitudes of participating daycare facilities to determine if this intervention will lead to increases in proper hand hygiene. Further, surveillance of changes in the number of RSV infections following implementation of the pamphlet as an intervention would enable an understanding of the effectiveness of this intervention at reducing actual infections rates.

**Dissemination of Results.** This project's results will be shared with other doctoral students who are also presenting their doctoral studies. Other avenues of dissemination included sharing the results with the participating daycares and expert reviewers and also by seeking publication through a peer-reviewed journal. As a result, multiple family medicine and pediatric groups may permanently incorporate this educational tool into their practice and become a part of their patient education. This author will also seek out other daycare facilities that would be interested in dispersing this pamphlet based on the success of this project.

**Conclusion.** Overall, the success of this project enlightened this author on the importance of directing infection prevention and health promotion education directly to primary caregivers of children five years of age and under in regards to RSV. Primary caregivers are hungry for information that leads to healthier outcomes for their families and were highly receptive to receiving that education through a written educational tool. By implementing the strategies listed in the pamphlet, primary caregivers have the opportunity to prevent the spread of RSV and avoid high costs, heavy burdens felt by all family members, and keep their children infection free and out of the hospital. Every family deserves the right to be educated about how to keep their loved ones free from RSV and this project achieved its goal by establishing an intervention that aims to do so.

Appendix A: Expert Survey



Department of Nursing

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**TITLE OF PROJECT:** Respiratory Syncytial Virus Prevention and Awareness Pamphlet

**INVESTIGATOR(S):** Kaylie Humphreys and Jessica Doolen

For questions or concerns about this Doctorate of Nursing Practice Project, you may contact Kaylie Humphreys at [humphk2@unlv.nevada.edu](mailto:humphk2@unlv.nevada.edu) or Jessica Doolen at [jessica.doolen@unlv.edu](mailto:jessica.doolen@unlv.edu).

For questions regarding the rights of project participants, any complaints or comments regarding the manner in which the project is being conducted, contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 888-581-2794 or via email at [IRB@unlv.edu](mailto:IRB@unlv.edu).**

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Please review the attached educational pamphlet and **circle** your response to the following four questions and statements to the best of your ability.

|                                                                                                      | Strongly Disagree | Disagree | Agree | Strongly Agree |
|------------------------------------------------------------------------------------------------------|-------------------|----------|-------|----------------|
| The <i>content</i> in this pamphlet is accurate relating to the prevention and awareness of RSV.     | 1                 | 2        | 3     | 4              |
| The <i>style</i> of this pamphlet is user friendly.                                                  | 1                 | 2        | 3     | 4              |
| This pamphlet would be <i>useful</i> for primary caregivers of children five years of age and under. | 1                 | 2        | 3     | 4              |
| The information presented in this pamphlet is <i>easy to read</i> and understand.                    | 1                 | 2        | 3     | 4              |

Comments for improving the pamphlet:

\*\*To submit your answers online, open the camera on your smart phone to scan the box below to be redirected to the survey.



## Appendix B: Primary Caregiver Survey and Informed Consent



### INFORMED CONSENT

Department of Nursing

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**TITLE OF PROJECT: RSV Prevention and Awareness**

**INVESTIGATOR(S): Kaylie Humphreys and Jessica Doolen**

Please do not direct any of your questions to the employees, managers, or owners of your daycare facility. For questions or concerns about this Doctorate of Nursing Practice (DNP) project, you may contact Kaylie Humphreys at [humphk2@unlv.nevada.edu](mailto:humphk2@unlv.nevada.edu) or Jessica Doolen at [jessica.doolen@unlv.com](mailto:jessica.doolen@unlv.com).

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted, contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 888-581-2794 or via email at [IRB@unlv.edu](mailto:IRB@unlv.edu)**.

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#### **Purpose of the DNP Project**

You are invited to participate in a DNP project. The purpose of this DNP project is to increase the awareness of Respiratory Syncytial Virus and learn how to prevent its spread among children five years of age and under using an educational pamphlet.

#### **Participants**

You are being asked to participate in this DNP project because you fit the following criteria:  
A primary caregiver of a child who is five years of age and younger.

#### **Procedures**

If you volunteer to participate in this DNP project, you will be asked to do the following:  
Answer the following four questions and return this sheet to an employee of the daycare facility or scan the code with your smart phone to take the survey online within one week of the received date.

#### **Benefits of Participation**

There will be direct benefits to you as a participant in this DNP project. However, we hope to learn if the attached educational pamphlet increases your awareness of RSV and that you and your family learn how to prevent its spread.

### **Risks of Participation**

There are risks involved in all DNP projects. This study may include only minimal risks including feeling uncomfortable answering the attached questions

### **Cost /Compensation**

There will be zero financial cost to you to participate in this DNP project. The project will take 10 minutes of your time. You will not be compensated for your time.

### **Confidentiality**

All information gathered in this DNP project will be kept as confidential as possible. Daycare facility employees will keep all paper surveys stored in a folder. No reference will be made in written or oral materials that could link you to this project. All records will be stored in a locked facility at UNLV for one week after completion of the project. After the storage time the information gathered will be shredded.

### **Voluntary Participation**

Your participation in this project is voluntary. You may refuse to participate in this project or in any part of this project. You may withdraw at any time without prejudice to your relations with UNLV. You are encouraged to ask questions about this project at the beginning or any time during the DNP project.

### **Participant Consent:**

I have read the above information and agree to participate in this DNP project. I have been able to ask questions about the project. I am at least 18 years of age. A copy of this form has been given to me.

**By completing the attached survey, I am consenting for UNLV to utilize my answers for the above stated DNP project.**

Please circle your response to the following four questions and statements to the best of your ability.

|                                                                | Strongly Disagree | Disagree | Agree | Strongly Agree |
|----------------------------------------------------------------|-------------------|----------|-------|----------------|
| This pamphlet was easy to read and understand.                 | 1                 | 2        | 3     | 4              |
| This pamphlet has increased my knowledge and awareness of RSV. | 1                 | 2        | 3     | 4              |

|  |            |          |      |        |
|--|------------|----------|------|--------|
|  | Not At All | Not very | Very | Highly |
|--|------------|----------|------|--------|

|                                                                                                    |   |   |   |   |
|----------------------------------------------------------------------------------------------------|---|---|---|---|
| How likely are you to use the recommendations listed in the pamphlet to prevent the spread of RSV? | 1 | 2 | 3 | 4 |
| How valuable or useful was the information given to you in this pamphlet?                          | 1 | 2 | 3 | 4 |

\*\*To submit your answers online, open the camera on your smart phone to scan the box below to be redirected to the survey.



## Appendix C: Final RSV Pamphlet

### WHEN TO SEEK MEDICAL HELP

- If your child has any of the "serious signs"
- If your child has less than 1 wet diaper in 6 hours
- If your child's lips, tongue, or skin turn **blue**
- If it becomes **hard to wake up** your child
- If your child's fever is:
  - **100.4°F** (Rectal, 0 - 6 months old)
  - **102°F** (Oral, 7 - 36 months old) **with Tylenol**
- If you feel **worried**

### TALK TO YOUR PEDIATRICIAN OR FAMILY MEDICINE PROVIDER TO LEARN MORE ABOUT RSV



### RESPIRATORY SYNCYTIAL VIRUS (RSV)



**UNLV** School of NURSING

This pamphlet was created by Kaylie Humphreys in collaboration with pediatricians, family nurse practitioners, physician assistants, and pediatric nurses as a doctoral nursing project.

HOW TO KEEP YOUR FAMILY FREE FROM RSV!

## WHAT IS RSV?

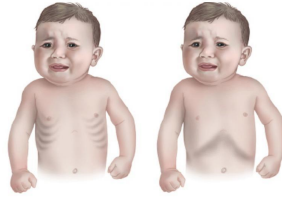
- A virus that is the **#1 cause** for sickness in the lungs
- Nearly **all** children will have RSV by 2 years of age
- RSV mostly spreads from **November through April**
- A few children may need to stay in the **hospital**



## WHAT WILL THE CHILD LOOK LIKE?

- **Early** signs look like a cold
  - Runny nose
  - Cough
  - Eating much less
  - Fever (100.4°F and up)
- Signs for a child **less than 6 months** old
  - Cries more
  - Panting
  - Poor feeding
  - Less active

- **Serious** signs of RSV
  - More than 50 breaths in 1 minute
  - Breaths with grunts or whistle sounds
  - Flared nostrils
  - Belly breaths that make the ribs an up-side-down "V"



## WHO IS AT A HIGH RISK?

- **All children** five years old and younger
- Babies born **before** 37 weeks
- Those who have **heart and lung** problems
- Those who have a hard time with their **swallow**

## HOW DO I STOP IT?

### 1 WASH HANDS

- Wash with soap and water for **20 seconds**
- **Scrub** hands with baby wipes
- Use an **alcohol-based** rub
- Don't touch your **face** with unclean hands



### 2 COVER COUGHS

- Use a **tissue** or the **sleeve** of your arm to cover a cough or sneeze, **not** your hands



### 3 CLEAN WITH BLEACH

- Use 1 teaspoon of bleach in 1 gallon of water to clean **toys, counters, door knobs**, etc.



### 4 STAY AWAY FROM CROWDS

- Try to stay away from those who are sick or places where there is tobacco smoke





## Appendix D: Facility Authorization Letters



### Letter of Authorization to Conduct Research

Office of Research Integrity – Human Subjects  
University of Nevada Las Vegas  
4505 Maryland Parkway Box 451047  
Las Vegas, NV 89154-1047

Subject: Letter of Authorization to Conduct a Doctorate of Nursing Practice (DNP)  
Project at The Goddard School, South Reno daycare facility.

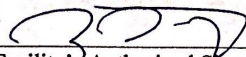
Dear Office of Research Integrity – Human Subjects:

This letter will serve as authorization for the University of Nevada, Las Vegas (“UNLV”) DNP project team, Kaylie Humphreys and Jessica Doolen to conduct the DNP project entitled RSV Prevention and Awareness at the above stated daycare facility in Reno, NV. The employees of the daycare facility will not answer any questions about this DNP project, but will be required to direct all questions regarding this project to the Kaylie Humphreys and Jessica Doolen.

The Facility acknowledges that it has reviewed the protocol presented by the DNP student, as well as the associated risks to the Facility. The Facility accepts the protocol and the associated risks to the Facility, and authorizes the DNP project to proceed. The DNP project may be implemented at the Facility upon approval from the UNLV Institutional Review Board.

If we have any concerns or require additional information, we will contact the researcher and/or the UNLV Office of Research Integrity – Human Subjects.

Sincerely,

  
\_\_\_\_\_  
Facility's Authorized Signatory

9.20.2019  
Date

Ryan M. Herwig, Owner  
Printed Name and Title of Authorized Signatory

# UNLV

## Letter of Authorization to Conduct Research

Office of Research Integrity – Human Subjects  
University of Nevada Las Vegas  
4505 Maryland Parkway Box 451047  
Las Vegas, NV 89154-1047

Subject: Letter of Authorization to Conduct a Doctorate of Nursing Practice (DNP)  
Project at Taty Binky Learning Center daycare facility.

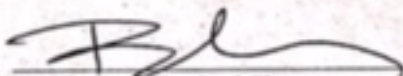
Dear Office of Research Integrity – Human Subjects:

This letter will serve as authorization for the University of Nevada, Las Vegas ("UNLV") DNP project team, Kaylie Humphreys and Jessica Doolen to conduct the DNP project entitled RSV Prevention and Awareness at the above stated daycare facility in Reno, NV. The employees of the daycare facility will not answer any questions about this DNP project, but will be required to direct all questions regarding this project to the Kaylie Humphreys and Jessica Doolen.

The Facility acknowledges that it has reviewed the protocol presented by the DNP student, as well as the associated risks to the Facility. The Facility accepts the protocol and the associated risks to the Facility, and authorizes the DNP project to proceed. The DNP project may be implemented at the Facility upon approval from the UNLV Institutional Review Board.

If we have any concerns or require additional information, we will contact the researcher and/or the UNLV Office of Research Integrity – Human Subjects.

Sincerely,

  
\_\_\_\_\_  
Facility's Authorized Signatory

12/16/19  
Date

Belinda Martinez  
Printed Name and Title of Authorized Signatory

# UNLV

## Letter of Authorization to Conduct Research

Office of Research Integrity – Human Subjects  
University of Nevada Las Vegas  
4505 Maryland Parkway Box 451047  
Las Vegas, NV 89154-1047

Subject: Letter of Authorization to Conduct a Doctorate of Nursing Practice (DNP)  
Project at The Child Garden daycare facility.

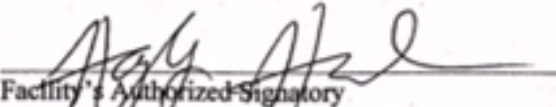
Dear Office of Research Integrity – Human Subjects:

This letter will serve as authorization for the University of Nevada, Las Vegas (“UNLV”) DNP project team, Kaylie Humphreys and Jessica Doolen to conduct the DNP project entitled RSV Prevention and Awareness at the above stated daycare facility in Reno, NV. The employees of the daycare facility will not answer any questions about this DNP project, but will be required to direct all questions regarding this project to the Kaylie Humphreys and Jessica Doolen.

The Facility acknowledges that it has reviewed the protocol presented by the DNP student, as well as the associated risks to the Facility. The Facility accepts the protocol and the associated risks to the Facility, and authorizes the DNP project to proceed. The DNP project may be implemented at the Facility upon approval from the UNLV Institutional Review Board.

If we have any concerns or require additional information, we will contact the researcher and/or the UNLV Office of Research Integrity – Human Subjects.

Sincerely,

  
\_\_\_\_\_  
Facility's Authorized Signatory

12/16/19  
\_\_\_\_\_  
Date

Hayley Hanel  
\_\_\_\_\_  
Printed Name and/Title of Authorized Signatory

## Appendix E: IRB Approval Email

----- Forwarded message -----

From: **Meg Rayner** <no-reply@irbnet.org>

Date: Wed, Nov 27, 2019 at 2:50 PM

Subject: IRBNet Board Action

To: Jessica Doolen <jessica.doolen@unlv.edu>, Kaylie Humphreys  
<kmhumphreys4@gmail.com>

Please note that UNLV Biomedical IRB has taken the following action on IRBNet:

Project Title: [1488777-2] RSV Prevention Project

Principal Investigator: Jessica Doolen

Submission Type: Revision

Date Submitted: November 19, 2019

Action: EXEMPT

Effective Date: November 27, 2019

Review Type: Exempt Review

Should you have any questions you may contact Meg Rayner at [meg.rayner@unlv.edu](mailto:meg.rayner@unlv.edu).

Thank you,  
The IRBNet Support Team

[www.irbnet.org](http://www.irbnet.org)



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direct=true&db=cin20&AN=105207227&site=ehost-live](http://ezproxy.library.unlv.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=105207227&site=ehost-live)

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# Kaylie M. Humphreys

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## Education

University of Nevada, Las Vegas September 2017 to Present

- **Doctorate of Nursing Practice; Family Nurse Practitioner**
- **GPA 3.95**

University of Nevada, Reno; Orvis School of Nursing December 2014

- **Bachelor of Science in Nursing**
- **GPA 3.63**

## Clinical Experience

September 2017 to Present

- Completed over 600 hours in family, adult gerontology, pediatric and obstetricgynecology clinical settings.
- Aim to complete a Doctorate of Nursing Practice project focusing on preventing the spread of Respiratory Syncytial Virus in local community daycares.

## Certifications

- BLS Certification (American Heart Association)
- ACLS Certification (American Heart Association)

## Work Experience

Saint Mary's Regional Medical Center March 2015 to Present

- **Registered Nurse**
  - Provide evidence-based care to cardiac patients being treated for myocardial infarctions, arrhythmias requiring pacemaker and AICD implantations, open heart surgeries, and exacerbations of congestive heart failure.
  - Educate patients and families regarding successful cardiac care management.
  - Facilitate patient care through medication administration, procedure preparation and nursing assessment.

Resort at Red Hawk, Swim and Fitness Center 2009 to 2011

- **Gym Attendant and Lifeguard**
  - Executed multiple pool rescues through participation as a primary lifeguard.
  - Prevented injury by maintaining a clean, neat, and organized environment.
  - Graduated over 100 swim lesson participants of varying age groups and skill levels.