A PATIENT RESOURCE TO SUPPORT THE UTILIZATION OF VIRTUAL CARE AT HOME IN RURAL COMMUNITIES

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Abstract

Background: Virtual care (VC) is a meeting between a patient and their health care provider using a form of technology that allows the patient and provider to be in different locations. Its use has increased since the onset of the COVID-19 pandemic but unfortunately, some rural areas in Newfoundland and Labrador (NL) did not adapt and increase their use of VC as quickly as those in urban areas. **Purpose:** To develop a patient resource to increase awareness and utilization of VC in a rural health area in the Western Health region of NL. **Methods:** A literature review was conducted to understand the barriers that existed and to explore any previous strategies and their effectiveness in relation to the implementation of VC visits among patients. Consultation interviews were then conducted with VC consultants and health care providers to determine if any previous strategies were successful in increasing the use of VC among patients. **Results:** According to the literature, several barriers exist that prevent the use of VC in rural communities, with the most common being a lack of awareness of VC and technology barriers. Effective interventions included providing VC devices to patients and technical support. The consultees reinforced that patient awareness on VC should be increased and technical support was necessary for successful VC visits. Pamphlets were previously used by the consultees to raise patient awareness and increase comfort levels prior to the availability of video VC from home and these were recommended for future use. Two pamphlets were developed; one provided general VC information to raise patient awareness of their ability to use VC and the other contained technical support information to build patients' comfort level with the technology required for VC. **Conclusion:** The goal is for these pamphlets to be distributed in common public areas such as the hospital/clinic, grocery store, and pharmacy in rural communities in the Western Health region.

Key Words: *rural health, virtual care, telehealth, remote patient visits*

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Introduction

Virtual care (VC) is a service that requires a form of technology to attend a meeting with a health care provider. A VC visit can be conducted from a patient's home using their home computer or smartphone with camera capability and has been available for patients to conduct health care visits for many years. However, due to the onset of the COVID-19 pandemic, VC has been encouraged more frequently to promote physical distancing and prevent the spread of disease. While the incidence of VC use among urban residents increased during the pandemic, VC use among rural residents remained low (Chu et al., 2021; Glazier et al., 2021). This indicated that residents in rural communities may require additional support to overcome any pre-existing barriers.

VC visits in four rural communities on the south coast of NL were of interest for this practicum project. These communities were Burgeo, Ramea, Grey River, and Francois. Residents of these communities often have difficulty accessing health care services due to the increased distance from their provider. Some residents may require ferry travel which can depend on weather conditions and can result in missed visits in unfavorable weather. The video VC option may help alleviate some of these challenges as it eliminates the need for patient travel. With reduced travel requirements, patients can avoid high travel costs (Robb et al., 2019; Ruf et al., 2020) and decrease the time spent on travelling for medical care (Beck et al., 2017; Ruf et al., 2020). However, through discussion with health care providers in these areas, the video VC service was described as under-utilized. By developing a resource for the residents of the four rural communities of interest in this practicum project, it is hoped that they can increase their awareness and understanding of the VC service and avail of the benefits that VC has to offer to easily connect with their health care provider from their home.

Objectives

This practicum project focused on the use of VC at home for patients in rural communities. The purpose and overall goal of this project was to develop a resource for residents of four rural communities on the south coast of NL to increase awareness and understanding of the VC at home service to conduct visits with their health care provider. This goal was accomplished by meeting four objectives that were defined at the beginning of the practicum project. The key practicum objectives were:

1. To identify issues, barriers, and effective strategies for implementing virtual care with patients;
2. To identify the learning needs in residents of rural communities for the use of virtual care at home;
3. To develop a learning resource to assist individuals to use virtual care at home;

and,

4. To demonstrate the following advanced nursing practice competencies:
    a. Health system optimization
    b. Education
    c. Research
    d. Leadership

Overview of Methods

In this practicum report, the objectives and methods used to achieve the practicum goal will be discussed, along with a summary of the literature review, consultation interviews, and patient resources developed. Additionally, recommendations will be made for the implementation and evaluation of the patient resources and a discussion of the advanced nursing practice competencies met throughout this project.

Three main methods were used in this project to meet the practicum objectives. These methods included an integrated literature review, consultation interviews, and resource development. The purpose of the literature review was to understand the barriers and challenges that existed in relation to the implementation of VC services for patients. Literature was also reviewed to determine if any previous strategies were effective in implementing VC services for patients. From this review, it was determined that the uptake of VC was low in rural areas and that several barriers contributed to this, with technology and lack of awareness barriers being the most frequently noted and highly supported in the literature. However, as high quality studies on implementation strategies were rarely reported in the literature, it was difficult to draw a strong conclusion on the effectiveness of the strategies found. The most common themes discussed throughout all VC implementation strategies were on providing information on the VC service and for technology support. The findings were summarized and will be discussed further in a summary of the literature review, while the literature review can be found in its entirety in Appendix A.

The consultation interviews were conducted to understand the barriers and previous strategies for VC at home in the province of NL. These interviews were important to identify any implementation strategies that were conducted locally and could not be accessed through a literature review. Semi-structured interviews were conducted with six participants and the findings were analyzed and written in the consultation report found in Appendix B. Information gained through these interviews revealed that no previous interventions were conducted with patients to support their use of VC and as a result some patients were unaware of the availability of the VC service in their area and were unfamiliar with the technology required for using it. This indicated that patients required further support prior to using video VC. It was discussed

that informative patient pamphlets were successful in increasing VC use by one participant. A summary of these consultations will be discussed further in the following section.

Resource development occurred with key information from the literature review and consultation interviews that informed the content and delivery style of the patient learning resource. As suggested by the literature review and consultation interviews, technology barriers and a lack of awareness of the VC service were factors that prevented successful VC use. Therefore, two patient resources were developed to minimize these two barriers. As suggested in the consultation interviews, a pamphlet was created for patient learning. The full patient resource pamphlets can be found in Appendix C and D and a summary of the resource developed will be discussed in an upcoming section of this report.

Summary of the Literature Review

Three databases were searched for literature within the past ten years to determine the significance of VC use, the factors that prevent the regular use of VC, and any interventions that supported VC use for patients. These databases included PubMed, CINAHL, and google scholar. From these searches approximately 1075 articles were retrieved with 26 articles that fit the criteria for inclusion in this review. Websites were also searched for grey literature to determine if any resources or interventions were in place to support VC use in NL and three sites were included from this search. Any relevant articles were critiqued using the Public Health Agency of Canada's (2014) critical appraisal toolkit (PHAC-CAT) for quantitative research and the Critical Appraisal Skills Programme (CASP, 2018) for qualitative research. The literature review is included in its entirety in Appendix A.

Incidence of VC

Evidence was retrieved from high quality studies that suggested that, despite the encouragement of VC use during the COVID-19 pandemic to promote physical distancing and

prevent the spread of disease, urban areas increased their use of VC more rapidly in comparison to rural areas (Chu et al., 2021; Glazier et al., 2021). Due to the low use of VC in rural areas, patients and the health care system can be negatively impacted. Patients spend more money and time on travel when continuing to use in-person visits as opposed to VC visits (Beck et al., 2017; Robb et al., 2019; Ruf et al., 2020). The health care system also had significantly higher costs associated with not using VC visits when it was available. Patients that could be seen through VC have reported to have a decreased potential of transfer to another health facility for further treatment, meaning that the services provided during a VC visit adequately addressed the patient's health care concerns (du Toit et al., 2019; Hofmeyer et al., 2016). The costs associated with a VC visit were much lower than a routine in-person visit or a visit to the emergency department (Lovell et al., 2021).

VC Barriers

Upon further investigation, several factors were noted that contributed to the lower use of VC in rural areas, such as the high financial start-up costs for VC visits (Bokolo, 2021; Lam et al., 2020; Woo & Dowding, 2018), lack of access to VC capable devices (Gardner et al., 2015; Padala et al., 2020) or an internet connection (Bokolo, 2021; Hawke et al., 2021; St. Clair & Murtagh, 2019; Woo & Dowding, 2018), and a lack of experience or comfort with the technology required to utilize VC services (Gardner et al., 2015; Greenhalgh et al., 2018; Hawke et al., 2021; Lam et al., 2020; Layfield et al., 2020; Powell et al., 2017; Slightam et al., 2020; Woo & Dowding, 2018). There were high costs for the equipment required to begin using VC for patients and the health care system which created a financial barrier (Bokolo, 2021; Woo & Dowding, 2018). There was an established association between income level and the preparedness or capability to use VC at home for patients, with those in lower income brackets

having higher rates of unpreparedness for VC (Lam et al., 2020). Individuals who had lower income may be likely to have device accessibility barriers and differences were noted in VC device accessibility and internet accessibility between rural and urban areas as rural residents were noted to have poor internet access and a lack of access to adequate devices capable of conducting VC visits (Padala et al., 2020; St. Clair & Murtagh, 2019). Technology barriers were the most frequently reported barrier in the literature for this review. There were several concerns noted by patients that deterred them from using or continuing to use VC, including issues with sign up or login passwords and an inexperience with technology. Some patients reported the technology used for VC visits was unreliable (Layfield et al., 2020) and others reported anxiety with the technology (Hawke et al., 2021). When patients were comfortable with the technology required for a VC visit, they were more likely to participate in VC (Gardner et al., 2015).

Furthermore, an association was made between increased age and decreased willingness to utilize VC which is problematic in rural areas as they often have an aging population (Gardner et al., 2015; Lam et al., 2020). Aside from these factors that contributed to the lower use of VC in rural areas, some patients were not using VC because they were not aware of the service and that it was an available option for them in their area (Palcu et al., 2020; Polinski et al., 2015; St. Clair & Murtagh, 2019).

Interventions to Support VC Use

The implementation and promotion of VC has increased very recently due to the COVID-19 pandemic and there is limited research conducted and literature available on the interventions utilized and their effectiveness to promote this service. Of the limited evidence found, two interventions were implemented to promote an increased use of VC, one with patients and the other with health care providers. In an uncontrolled before and after (UCBA) study, patients

were provided VC capable devices along with technical support to attend their visits using VC (Slightam et al., 2020). When the service was evaluated by patients in a follow up survey, patient-reported satisfaction had increased, and patients were more likely to recommend the VC service to others. In a cross-sectional study by Esper et al. (2020), training on VC was implemented to health care providers and the amount of VC visits was evaluated after the study period. The number of video VC visits increased during the study period and was 84% of the total visits conducted after the training was completed.

For both interventions reported in the literature review, a causal association could not be linked due to the weak designs and medium quality of both studies. Since technical support was provided in both studies for patients and health care providers, this was another factor that was evaluated in both studies at their completion. Patients in the UCBA study reported that they were highly satisfied with the technical support they received (Slightam et al., 2020), while the researchers in the cross-sectional study noted the hub-and-spoke model was effective in providing timely support and improvements to the VC service (Esper et al. 2020). Although no causal association could be drawn between the increase in satisfaction and use of VC and the provision of VC capable devices or technical support and training, it is important to note that when patients and health care providers have the appropriate VC capable devices and the knowledge to navigate the VC platform there is the potential of increased use of VC.

Three additional reports also supported the use of technical support and the promotion of patient awareness for successful VC implementation (Greenhalgh et al., 2018; Hill et al., 2021; Schwamm, 2014). However, the authors of these reports did not implement any intervention with patients or health care providers and only gave recommendations for successful VC implementation based on their experiences. From the studies and reports that were included in

the literature review, it was determined that the approach with the greatest impact on VC use would be a combination of information on VC to promote patient and provider awareness and resources to support technology use (Esper et al., 2020; Greenhalgh et al., 2018; Hill et al., 2021; Schwamm, 2014; Slightam et al., 2020).

Summary of Consultations

After the literature review was completed and the consultation plan was approved, consultation interviews were conducted with individuals employed in the rural area of interest for this practicum project and those who had experience with the implementation, promotion, or management of VC services across the province of NL. Emails were sent to four health care providers who were employed in the rural area of interest and six VC consultants who were employed throughout the province of NL and had responsibility for the management or implementation of VC services for patients and/or providers. Six participants responded that they were interested in participating (three health care providers and three VC consultants). Interviews were conducted with these six individuals between July 27, 2021 and August 5, 2021. Interview guides were used to conduct semi-structured interviews with these individuals. Questions were asked to participants to understand if VC was being used in their area, the barriers that were experienced prior to using VC, and any interventions that were implemented to promote or orientate patients and providers to VC. Participants were also asked if they had seen additional barriers that prevented successful VC use in their area or had any further suggestions on how to increase the use of VC.

The findings were compared and analyzed as they were received using the constant comparative analysis suggested by Streubert and Carpenter (2011) as an analysis technique for qualitative data. After the data analysis was completed, three themes were derived from the responses received. These themes were: VC barriers, educational resources or orientation

strategies, and other strategies.

Consultation Results

Key findings from these consultations were similar to the findings highlighted in the literature review. The six participants included in the consultation interviews reported five barriers that were present that prevented VC use for patients. These barriers were video VC not being offered to patients by their health care provider, a lack of patient awareness, a lack of VC capable devices, difficulty with the use of VC technology, and inadequate bandwidth.

Participants acknowledged that VC via phone was utilized in rural areas of NL, but the video portion of VC was very rarely used and in the rural area of interest for this project, was not used at all. Three health care providers and two VC consultants reported that video VC was not offered as an option for patients, and this contributed to the lack of awareness of VC in these areas. Two VC consultants felt that some patients did not have access to VC capable devices if they wanted to conduct a VC visit. Two other participants noted that technical barriers prevented patients from successfully using VC. They noted that patients needed to have an email address and select the correct web browser to conduct VC visits successfully and felt that these aspects should be discussed with patients prior to using VC. The lack of adequate bandwidth was one barrier noted by three VC consultants that would not be altered with any educational resource as it requires high financial costs.

Synthesis of the consultation discussions revealed that most participants (four out of six) felt that patients were not properly orientated and would require further support in using the technology associated with video VC visits (e.g., how to set up a valid email address prior to participating in a VC visit, and how to select the proper web browser to support the VC visit). Current resources and training were focused on health care providers and all participants felt that

patient resources were lacking. They also reported that patient awareness should be addressed as many patients are not aware that the service exists or that they can request to be seen by a video VC visit with their provider.

Although the participants noted that patients required further education on VC, there were few interventions that were previously discussed and few suggestions on how to implement this resource for patients. One VC consultant discussed previously used pamphlets for patients on VC services, but since this was implemented prior to the availability of the VC at home service, the resource requires updating. This was reported to be effective at the time it was implemented as patients were appreciative of the information and VC use had increased.

A second VC consultant noted that the VC from home service was publicized throughout the community at the onset of the COVID-19 pandemic and patients were encouraged to use the newly developed resources and guidance from the NLCHI (2020) website. The effectiveness of this intervention was not formally evaluated. Additionally, three participants reported that patients could receive funding or be loaned a VC capable device from the regional health authority if the lack of a VC capable device was a barrier for them. Two other participants discussed the need for updated policies and standardization of care across the province to promote the use of VC services. However, this policy change is beyond the scope of development for this practicum project.

Summary of the Resource

Key information from the literature review and consultation interviews provided evidence to support the development of the resource. Findings from the literature review indicated that patients may be unaware of their ability to use video VC and that many struggled with the use of technology that was required for a successful VC visit, including which web browser to use for a

VC visit or ensuring a valid email address and adequate internet connection is set up prior to the appointment date. Discussions during the consultation interviews revealed that participants felt resources should be geared toward patient awareness and learning since no interventions were implemented to promote VC use among patients. It was also suggested during these interviews that a patient resource in the form of a pamphlet may be effective to increase the use of the video VC service, hence it was worthwhile to recreate a pamphlet for patients to raise patient awareness and build confidence in technology use for VC. For these reasons, two patient educational pamphlets were developed on VC awareness and technology support.

Furthermore, it is important to note that RNs and NPs have an obligation to provide safe and ethical care to all patients and with the recent increase in VC use to conduct health visits, the College of Registered Nurses of Newfoundland and Labrador (CRNNL, 2020) has developed Virtual Practice Guidelines to support all nurses who use VC to meet with patients. These guidelines indicated that nurses must ensure that they have obtained patient consent to use VC, that the visit will be conducted in a private, confidential environment using appropriate technology (e.g., both participants have a camera capable device), and evaluate the appropriateness of using VC for each patient situation. To uphold these guidelines, the patient resources developed in this practicum project included information on the equipment required of patients, the importance of attending visits in a quiet, private area, and the health conditions that are and are not acceptable to be addressed using VC. The details of these pamphlets are listed in Table 1 and will be discussed further throughout this section. The VC awareness patient resource pamphlet can be found in Appendix C and the technical support patient resource pamphlet can be found in Appendix D of this report.

Table 1

List of Topics Included in the Patient Educational Pamphlets

VC Awareness	Technical Support
• VC definition • VC benefits for patients of rural communities • Where VC is available • Where to use VC (i.e., a quiet, private place) • Conditions acceptable for VC use (e.g., non-urgent medical concerns or prescription refills) • Conditions not acceptable for VC use (e.g., chest pain or shortness of breath) • Contact information if patients have further questions	• Patient requirements for VC use (e.g., camera capable device, valid email address, and adequate internet connection) • How to select the appropriate web browser • Instructions for conducting a test call • Instructions for connecting to the VC visit • NLCHI resource links for self-directed learning • Tips for successful VC use • Contact information for further technical support

VC Awareness

The goal of the VC awareness resource was to decrease the lack of awareness barrier that was previously identified throughout the literature and consultation interviews. It was identified in the literature that patients who were aware of their option to use VC and understood the service were more likely to be satisfied with their VC visit (Polinski et al., 2020) and that the lack of awareness barrier may be present in rural patients and providers (Palcu et al., 2020; St. Clair & Murtagh, 2019). Despite these findings, the participants identified throughout the consultation interviews that the patient population specifically lacked knowledge regarding VC. There were also no formal interventions conducted to increase patient awareness of VC. For these reasons, creating a resource to promote patient understanding of VC and ensuring they are aware that this service exists for them may be beneficial in increasing the use of VC in the rural areas of interest for this project.

This patient resource featured a definition of VC, a description of the benefits that VC

has for residents in rural communities, appropriate health conditions suitable for VC use, where to use VC, and contact information for those who have further questions that were not answered throughout this resource. All information provided would increase patient awareness and understanding of the video VC from home option.

VC Technical Support

The technical support resource was developed to increase patients' comfort level with technology use prior to attending a VC visit. The goal was to minimize the technology barriers that were described in the literature review and consultation interviews by ensuring patients had experience with the technology required for VC use. Technology concerns can negatively impact a patient's choice to use VC, therefore increasing patient knowledge and experience with the technology required for a VC visit prior to attending the visit with their health care provider has the potential of increasing patient willingness to use VC and having a successful VC visit (Hawke et al., 2021; Lam et al., 2020; Powell et al., 2017; Woo & Dowding, 2018). This resource contained instructions on how to conduct a test call prior to the VC visit, how to connect to the visit, what equipment was required, and tips to ensure patients had a successful visit. Gardner et al. (2015) reported that patients who were comfortable with navigating the technology aspect of the VC visit may be more likely to participate in VC and thus, several links were also provided from the NLCHI (2020) website to promote self-directed, independent learning and to assist patients in becoming comfortable with the VC platform. Contact information was also provided if patients required additional technical support.

Theoretical Framework

With the knowledge that the information would be targeted toward an adult audience in four rural communities of NL, Knowles' adult learning theory (ALT) was used to provide key

information to support resource development. Knowles' ALT described that adult learning is different than learning as a child, and therefore the educational approach to this population should be different as well (Candela, 2020). Adults are likely to have success with learning new concepts when they feel the information is relevant and important to them in their environment. Any information provided should be geared toward completing a task or solving a problem and allow for learning to be self-directed.

To ensure these resources were personally relevant to those in the four rural areas of interest, there were photos featured from one of the communities and as recommended by Knowles' ALT, information was targeted toward providing the skills required to solve the problem of navigating a successful video VC visit (Candela, 2020). Patients could also access the provided links from the NLCHI (2020) website at a time that was convenient for them to promote self-directed learning. As described by the Government of NL (2020), the province of NL's aging population has increased more quickly in this province than in any other province across the country due to younger residents relocating for work or school. To accommodate for increased age that was likely present in these rural communities, large print was used throughout the pamphlets for those with vision difficulties and language was appropriate for lay audiences. Software was used from the Microsoft Word program to assess reading level to ensure the text was as close to the grade six reading level as possible.

Discussion of Advanced Nursing Practice (ANP) Competencies

The Canadian Nurses Association (CNA) developed the ANP competencies to guide advanced practice nurses in conducting safe and ethical care (CNA, 2019). There were six ANP competency categories developed that acknowledge the role of the advanced practice nurse in clinical practice. Four of these competencies were exhibited throughout this practicum project

and include*: Optimizing health system competencies, Educational competencies, Research competencies, and Leadership competencies*. These will be discussed further in this section.

Optimizing Health System Competencies

The CNA (2019) described the advanced practice nurse as meeting health system optimization competencies through identifying and advocating for change to promote the effectiveness of the health care system and high quality patient centered care. From the work completed on my practicum project, I have described that the use of VC is effective for the health care system to reduce unnecessary financial expenses. The cost of using VC is less than the cost associated with an in-person visit and much less than a patient visiting the emergency department (Lovell et al., 2021). VC usage also has the potential to reduce unnecessary patient transfers, which ultimately reduces costs for the health care system and emotional stress for the patient (du Toit et al., 2019; Hofmeyer et al., 2016). Additionally, evidence from the literature review also supported that the regular use of VC can save patients the time and cost for travel to their health care provider since they may attend VC visits in their own home (Beck et al., 2017; Robb et al., 2019; Ruf et al., 2020).

VC can be beneficial to residents of rural communities for these reasons. However, in the four rural areas in this practicum project, I identified that this service was under-utilized and as a result patients may continue to have challenges in relation to the travel required to meet with their health care provider. The patient resources were developed for this project with the goal of increasing the use of VC in these rural areas, while the implementation and evaluation plan discussed a strategy for facilitating change in my practice environment. With this suggested shift in the delivery of services, there can be improvements in health care accessibility and in turn, the health of those in rural areas.

Educational Competencies

The advanced practice nurse can demonstrate educational competences through their commitment to learning and growth for patients and members of the health care team to promote health and wellness (CNA, 2019). I have demonstrated educational competencies throughout this practicum project as I have identified the potential learning needs of patients in the rural areas of interest through discussion with health care providers and VC consultants and with support from the literature review. Through presenting my literature review and consultation findings in combination with the resource that was developed to colleagues in the Master of Nursing (MN) program and with plans to make health care providers and clerical staff in the rural area of interest aware of these findings as well, I have created an opportunity for learning among these individuals. Additionally, I can act as a mentor for beginner use of video VC in this area.

Research Competencies

Advanced practice nurses can demonstrate research competencies through critiquing, synthesizing, or applying research to their nursing practice (CNA, 2019). I have demonstrated research competencies throughout each method utilized in this practicum project. Initially, a detailed literature review was conducted using several databases to locate articles that were relevant to VC in rural areas. I was able to locate and include 26 articles in the review and critiqued these articles using the PHAC-CAT (2014) for quantitative research or the CASP (2018) for qualitative research. This critique allowed me to understand where I could make causal associations between the use of VC and the outcome described in the study. After articles were found, selected according to relevancy criteria, and critiqued for quality, the research findings were synthesized and reported according to their generalizability for rural areas. This provided an understanding of the barriers to VC utilization and any interventions that had been

previously implemented to support VC use for patients.

Secondly, prior to conducting the consultation interviews, I was able to apply my research knowledge and skills in obtaining informed consent from all participants and upholding the ethical standards required of me throughout data collection, management, and analysis. All participants were ensured that their participation was voluntary and that interview responses would be kept confidential, stored on a password protected personal computer, and discarded after project completion. The process of conducting interviews, managing data in a Word document, and analyzing data using the comparative content analysis approach also allowed me to practice research methods. The processes of critiquing and synthesizing research in the literature review and consultation interviews allowed me to appropriately apply the research findings to my practice area and inform the content and delivery style of the patient learning resources for this project.

Leadership Competencies

The CNA (2019) noted that leadership was exhibited when problems can be identified in a practice area and action can be taken to minimize or eliminate these problems to improve the care provided to patients. The problem of low video VC use from home for residents of rural areas was identified in my practice and investigated through a literature review and consultation interviews. Evidence was found to support the barriers that existed and the development of a patient learning resource to minimize these barriers with the potential of increasing the use of VC. Action was the taken with support from the consultation findings and two patient educational pamphlets were developed to increase VC awareness and provide technical support for patients in the rural areas of interest identified in this project. A PowerPoint presentation was developed and recommendations for the implementation and evaluation of this resource were

made and are outlined below. This presentation was made with several individuals throughout the MN program to raise awareness of this practice issue and it is recommended that a similar presentation be conducted with health care providers and clerical staff in the rural communities of interest to ensure they are also aware of the low video VC use in their area. Through this presentation, the challenges of implementing VC in rural areas and the newly developed patient educational pamphlets for VC awareness and technology support can be discussed to promote understanding of the benefits of video VC use in rural areas and to ensure health care providers can continue advocating for VC use in these areas. The manager of rural health services was made aware of the progression of this project and the development of both patient educational pamphlets to increase VC use in the rural area of interest.

Next Steps

Several recommendations have been developed to support the implementation and evaluation of this patient resource in the rural area of interest for this project and will be discussed further throughout this section.

Implementation

The goal of this project is for public dissemination of the patient resources in the rural areas of interest (i.e., Burgeo, Ramea, Grey River, and Francois). Recommended areas for potential public dissemination include the hospital in Burgeo, the medical clinic in Ramea, pharmacies, grocery stores, churches, advertising on the local community channels or community bulletin boards, or through mailing printed resources. Additionally, these patient resources can be given to all inpatients from the rural areas of interest upon discharge from the hospital in Burgeo to ensure they are aware of the video VC option as an available service to them for their follow up visit with their health care provider. It is suggested that the resources

can be disseminated by myself in collaboration with the patient care coordinator (PCC) at the hospital in Burgeo as this individual is present Monday to Friday and can ensure resources are available as requested at the hospital. In the Ramea medical clinic it is reasonable to assume the clerical staff can assist with resource dissemination, while in Grey River and Francois a volunteer in the community can be recruited to assist in placing resources in common public areas as discussed above. Prior to disseminating any patient resources, approval must be granted by the manager of rural health services in Burgeo and any manager of a business where resources may be located.

Among the four rural communities of interest for this project, only one community has a hospital with inpatient and outpatient services (Burgeo) and one community has a regularly functioning medical clinic operating Monday to Friday (Ramea). The remaining two communities (Grey River and Francois) do not have any medical clinic or hospital services in their community and therefore disseminating the resource solely at hospitals or medical clinics should not be the only option for this area. There are also additional challenges in these areas as some communities do not have pharmacies, gas stations, or local radio stations and thus, dissemination options should be diverse to ensure the pamphlets are available equally in each community.

To ensure the health care providers and clerical staff are aware of this patient resource in Burgeo and the surrounding area, it is suggested that a presentation be conducted with the health care providers and clerical staff in Burgeo and Ramea. The presentations should be conducted by an individual with experience and knowledge about VC and the resources that will be implemented in these areas. After the in-depth work conducted on this topic and the development of both patient resources, it is reasonable to suggest that I can deliver presentations to both areas

and act as a mentor for staff on the use of VC. This presentation should discuss the benefits for VC use in rural areas and all other elements featured in the patient resources to ensure staff are aware of the video VC from home option and be able to continue to promote the video VC service for patients, answer patient questions, or further disseminate resources if requested.

It is important to note that the patient resources are recommended to be implemented in the four rural areas identified in this practicum project. However, the potential for dissemination among other rural areas in the Western Health region can be discussed. Prior to utilizing this resource in other areas, it should be adapted to accommodate the needs of other rural areas where it will be disseminated. These modifications may be as simple as changing the images used to images from the area of interest. Furthermore, the option of discussing this resource with the four regional telehealth coordinators in the regional health authorities (RHAs) across the province can be explored for the potential of adapting this resource in other rural areas as well.

Evaluation

Once this resource is disseminated to providers and patients in the rural area of interest for this project, it should be evaluated to determine its effectiveness or need for modification. There are several recommendations for potential ways to evaluate this resource. Initially, tracking the number of pamphlets accessed by patients can allow for understanding of how many patients have read the resources. Completing an audit of the VC system may provide insight as to how many video VC visits have occurred since the resource was disseminated. A patient satisfaction survey can be circulated to all patients who visit the hospital or clinic for an in-person visit with their health care provider and this survey can be mailed to any patient who has a telephone or video VC visit with their health care provider. This survey would address patient satisfaction with the pamphlet (if they had the resource) and if it influenced their choice to use

VC, had an impact on the ease of use for VC, or satisfaction with the VC service. Questions on the survey would be targeted toward specific aspects of the pamphlet and if it influenced the patient's decision to use VC or if it increased their awareness of VC and/or comfort level with the technology required to use VC. For example, patients can be asked, 'Did you avail of the resources provided from the NLCHI website? If so, did you feel these resources were effective in preparing you to use VC?' Completing this survey would provide insight to the effectiveness of the resources developed and can indicate where modifications should be made prior to disseminating in other areas. Finally, it is recommended that the calls made for VC technical support or general VC inquiries be tracked to determine if patients are continuing to have questions or concerns after reading the resources. It is suggested that any audits be completed between three to six months after the resource is initially implemented. Although these evaluation components are suggested as part of this practicum project, it is important to note that future research projects may be required to properly evaluate this resource.

Through evaluating these resources using the methods described above, a greater understanding can be achieved of the effectiveness of the resources in increasing the use of VC in Burgeo and the surrounding coastal communities. If very few resources were disseminated to patients, then it would be likely that the resource implementation plan should be modified. Similarly, if the number of video VC visits has not increased and the calls for additional information and/or technical support are high, then it is likely that the pamphlet resources should be modified to reflect the patients' needs. Additionally, the patient satisfaction survey may indicate what areas of the resources were helpful for the patient and what information influenced their choice to use, or not use, video VC.

Conclusion

Through the completion of this practicum project the four objectives outlined at the beginning of this report have been met and have been discussed in detail. It was evident after completing a detailed literature review that a lack of VC awareness and inexperience with the technology required for a VC visit were two main barriers that prevented VC use. After several consultation interviews it was identified that these barriers are likely to be factors that prevent the use of VC in this area as well. The goal of creating a resource to promote patient awareness and understanding of the VC service was achieved as two patient educational pamphlets were created. The patient resources developed here were supported by Knowles' ALT and the information provided was directed specifically toward the target audience in the four rural communities of interest for this project. Following the recommended implementation and evaluation plan may allow the resources developed in this project to be successfully disseminated for patients in the four rural communities identified. Through completion of this practicum project and using the methods discussed above, I was able to demonstrate ANP competencies in optimizing the health system, education, research, and leadership.

In summary, the barriers and challenges experienced in the four rural communities in this project may be reduced with the support provided in the resources developed on VC. The incidence of video VC use in these rural communities may increase as a result of the implementation of these resources and the residents can experience the financial and time saving benefits of VC and have easier access to health care services from their home. With the suggested implementation and evaluation plan, the resources can be disseminated and then evaluated to determine their effectiveness or indicate any areas that may require modification to fit the needs of the residents of Burgeo and the three surrounding coastal communities.

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Appendix A

The Use of Virtual Care in Rural Health: An Integrated Literature Review

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The Use of Virtual Care in Rural Health: An Integrated Literature Review

Virtual care (VC) is being encouraged in our society now more than ever due to the COVID-19 pandemic. VC is defined as, "any interaction between patients and/or members of their circle of care, occurring remotely, using any forms of communication or information technologies with the aim of facilitating or maximizing the quality and effectiveness of patient care" (Canadian Medical Association, 2019, p. 5). VC can be synchronous (i.e., using real-time conversation via phone or video call) or asynchronous (i.e., email discussion) but all forms consist of the patient and provider not being in close physical proximity (Bokolo, 2020).

The benefits of VC have been widely noted in the literature including the cost, time, and travel savings for patients and financial savings for the health care systems (Beck et al., 2017; Robb et al., 2019; Ruf et al., 2020). With VC benefits being widely reported and the service being encouraged more frequently than ever, the question remains as to why the uptake of this service is low for the general population, and even lower for rural areas. When rural residents are aware of the potential use for VC in their area, have adequate devices capable of conducting a VC visit, and the proper technical support in place, the challenges and barriers that are present can be minimized and the uptake and regular use of VC can be increased. The purpose of this literature review is to understand what barriers or challenges exist in relation to the implementation of VC visits among patients. Additionally, literature will be reviewed to explore previous strategies and their effectiveness in initializing VC services for patients.

Search Methodology

The databases PubMed, CINAHL, and google scholar were searched for articles that would provide information that supported the significance of VC use and factors that prevented VC visit success. Study selection was limited to articles that were published within 10 years and written in the English language. Any study that focused on the use of VC for nursing education

or virtual reality for patients were excluded from this review as the focus for this project is on VC use from home for patients.

Search terms included virtual care, virtual visits, telehealth (Mesh), telemedicine (Mesh), patient satisfaction, patient perception, barriers, and virtual care challenges. These terms were used alone and in various combinations to retrieve literature. The same databases were used to search for any intervention that supported patient use of VC. Mesh terms included patient orientation OR client orientation, patient education OR client education, orient* OR implement* OR intervention strateg*, patient learning, and learning styles. From these searches approximately 1075 articles were retrieved.

Any articles that appeared appropriate from the title alone were accessed and the abstract was read to determine relevancy to the topic of interest. Articles were deemed relevant if they discussed the use of VC in a rural area, addressed the impact of VC use on patients or the health care system, or had an intervention or strategy used to overcome the barriers of VC use and promote successful VC visits for patients. A total of 34 articles were printed and read in their entirety and ten were excluded at this point due to not containing any information pertinent to the criteria above. The reference lists of the remaining articles were read to determine if any additional articles were appropriate. From this search a total of two articles were added. A total of 26 articles were included in this review.

Additionally, websites were searched for grey literature on any interventions that were implemented to support patient use of VC in NL. This search was necessary to determine the resources that are currently in place or those that were attempted to support VC use for the patient population. The grey literature sites were also searched to determine if the current resources or efforts were effective in overcoming barriers and promoting a successful VC visit.

From the nine sites that were searched for pertinent grey literature information, three sites were utilized in this review.

Each study that was included in this review was critically appraised to determine the study strength and quality. All quantitative studies were appraised using the Public Health Agency of Canada's (2014) critical appraisal toolkit (PHAC-CAT). The qualitative studies were appraised using the Critical Appraisal Skills Programme (CASP, 2018). Key articles that focused on implementing an intervention to promote the increased use of VC were summarized in a literature summary table (see Appendix A1).

Background

Prior to identifying the barriers and challenges of VC and the strategies to promote the uptake of VC among patients of rural communities, it is important to consider the higher proportion of individuals residing in rural areas in NL than in other provinces across the country. These individuals should have resources such as VC available to them to decrease any barriers they face when accessing health care services. With a delayed uptake in VC use among rural residents, there have been apparent consequences of not utilizing the VC service and resulting impacts on patients and the health care system. All these points will be discussed further throughout this section.

Incidence of Virtual Care Use

Three studies were included to evaluate the incidence of VC use. Two of these studies addressed VC use among patients with a cross-sectional study (Chu et al., 2021) and an inadequate interrupted time series (ITS) design (Glazier et al., 2021), while one cross-sectional study addressed VC use among nurses (Canada Health Infoway, 2020). Chu et al. (2021) conducted a survey in Ontario among patients who received at least one VC visit between

January 2012 and June 2020. Patients' visit type and location were assessed, and location was categorized as urban or rural. The inadequate ITS study by Glazier et al. (2021) was also conducted in Ontario, and similarly recorded visit type and location. These findings were recorded between January and July 2019 and compared to the same months in 2020. The third study focused on nurses not patients; Canada Health Infoway (2020) surveyed 1642 nurses on their use of VC.

All three of these studies had weak designs. However, they were all high-quality studies and provided key evidence on the incidence of VC use. In two studies the incidence of VC was evaluated pre and post COVID-19 (Chu et al., 2021; Glazier et al., 2021). The third study was conducted with nurses between January and March 2020, prior to the beginning of the COVID-19 pandemic (Canada Health Infoway, 2020).

Prior to the COVID-19 pandemic the use of VC was low, and differences were noted in rural versus urban settings; however, results from the two studies of patient visits were contradictory. Chu et al. (2021) found that VC use was slightly greater among rural residents (11 rural vs. 7 urban VC visits per 1000 patients), while Glazier et al. (2021) found a higher VC use among urban residents (27.6% urban vs. 9.7% rural). Canada Health Infoway (2020) did not report results specifically for urban versus rural areas but did report that nurses were using VC to connect with patients more frequently in recent years. In 2020, VC visits between nurses and patients were 27%, which was up from 3% in 2017.

The COVID-19 pandemic had an impact on the use of VC as it has been encouraged to promote physical distancing and limit the spread of the coronavirus causing COVID-19. However, the two studies have shown that the uptake of VC use remains lower in rural areas than urban. Chu et al. (2021) found that 147 rural visits per 1000 patients used VC while 220 urban

visits per 1000 patients used VC. Glazier et al. (2021) reported 5.4% rural VC visits in comparison to 45.7% large urban VC visits for the same period. Additionally, it is important to note the trend for VC use described by Chu et al. (2021) has reversed from a slightly higher use in rural areas prior to the COVID-19 pandemic, to a higher use in urban areas post COVID-19. This indicated that rural residents did not increase their use of VC as quickly as urban residents.

Ultimately, the trends exhibited by these studies still indicate that VC use among rural populations is low despite the push for VC brought on by the COVID-19 pandemic. All three studies had weak designs but were high quality and thus provided valuable information on VC use. Although Ontario has a much larger population than NL, most of this population resides near an urban area near southern Ontario. Rural areas are still prominent in this province and are located toward northern Ontario which is a significant distance from urbanized areas; therefore, it is reasonable to generalize these studies to the rural population of interest in NL.

Impact of Virtual Care Use

As a result of the lower use of VC in rural areas, there have been considerable impacts on patients and the health care system noted throughout the literature. These impacts will be discussed further in this section.

Impact for Patients

Four studies reported significant impacts for patients who did not use VC. Two studies were randomized controlled trials (RCTs) (Beck et al., 2017; Robb et al., 2019), one was a cross-sectional study (Ruf et al., 2020), and one was a qualitative interview study (Triantafillou et al., 2021). All four studies measured the cost and/or time savings that occurred when patients chose to use VC in comparison to in-person visits.

Two studies were RCTs that compared in-person care to the use of VC as an intervention. One study was conducted among individuals with Parkinson disease (Beck et al., 2017) and the other with individuals who were diagnosed with multiple sclerosis (MS) (Robb et al., 2019). In addition, Robb et al. (2019) had a crossover design that provided a greater control for confounders. Beck et al. (2017) recruited participants through online advertising across the United States (US), while Robb et al. (2019) recruited their participants from the University of Rochester MS clinic in the US. The qualitative study consisted of an unstructured telephone interview with 56 patients who participated in an otolaryngology VC visit. Ruf et al. (2020) was the only study that specifically evaluated VC use in a rural setting. The records for 229 appointments were assessed during the period between January 2016 and June 2017 for individuals with inflammatory bowel disease (IBD) in a clinic in Scotland. The researchers recorded patient location and the distance required for travel if the patient were to attend an in-person appointment. They also calculated the potential cost of travel.

Two of the three quantitative studies were RCTs that had strong designs (Beck et al., 2017; Robb et al., 2019). Ruf et al. (2020) had a weak design in their cross-sectional study. However, all three studies were high quality. The one qualitative study was of high credibility since the researcher was clear on the data collection process, biases were reduced when deciding on themes, and triangulation of the data findings occurred (Triantafillou et al., 2021).

There were increased financial costs and distance required for travel for patients who did not use VC. Two studies reported the additional travel cost of $36.61 (Ruf et al., 2020) and $49 (Robb et al., 2019) per in-person appointment that was not evident when patients used VC. The distance travelled to attend in-person appointments was also higher. Ruf et al. (2020) reported an average of 310km (95% CI [295.5km–324.6km]) travelled per in-person appointment. In

comparison, Beck et al. (2017) reported a median of 38 miles (95% CI [36-56], p<0.0001) of additional travel to attend in-person appointments that could be saved if VC were utilized.

It is evident from these studies that patients incur an increase in cost and distance travelled when they continue to use in-person appointments instead of VC. The studies that supported these findings are highly credible and have high quality in combination with a strong study design. Although Beck et al. (2017), Robb et al. (2019), and Triantafillou et al. (2020) evaluated participants in urban settings, they noted differences in cost and distance travelled when using in-person versus VC appointments. These populations are different than the rural population of interest, but it can be assumed that the cost and travel savings reported in an urban population can only mean a higher cost and travel savings in rural areas where patients are likely to be further from services than urban patients. Therefore, these findings can be applicable to the rural setting of interest.

Impact on the Health Care System

Three studies reported impacts on the health care system when VC was not utilized. The first study was a systematic review of 15 studies that evaluated the outcomes of VC in a rural emergency department setting (du Toit et al., 2019). Two of the outcomes measured in this review reported on the transfers that occurred and could be avoided if patients were seen through VC for assessment, and how VC resulted in a change in patient diagnosis and management.

This systematic review provided strong evidence to support the impacts on the health care system despite having medium quality. The review was rated as having medium quality since the methodology excluded grey literature and studies that were non-English. Additionally, there were only four studies, two mixed methods, one case series, and one cross-sectional study, summarized in the review that supported the difference in unnecessary patient transfers when

utilizing VC. There were five studies, three case series, one mixed method, and one cross-sectional, that supported the finding that VC resulted in a change in patient diagnosis and management.

The four studies from the systematic review found that patient transfers were reduced in 8.5% to 77% of VC consultations, indicating that the care provided through a VC visit appropriately dealt with the patient's concerns and transfer to another health facility for further care was not necessary (du Toit et al., 2019). The five studies from the review reported that the patient's diagnosis and/or management plan were altered as a result of VC in 18% to 66% of consultations. One of these studies, a case series, reported that VC was used to make the initial diagnosis among patients in 55.6% of consults and in this group, only 7.3% of patients required a transfer for further assessment or medical care.

Additionally, two cross-sectional studies that were not included in the systematic review found patient transfers occurred unnecessarily when VC was not used and additional costs were associated with in-person visits (Hofmeyer et al., 2016; Lovell et al., 2021). Lovell et al. (2021) studied the costs of using VC in comparison to primary care visits, urgent care visits, and emergency visits between April 1, 2016 and March 31, 2017 in Utah, US. The remaining study evaluated the number of transfers that occurred when VC was not utilized among 34 long-term care (LTC) sites (Hofmeyer et al., 2016). Fourteen of the 34 sites were in a rural setting. These two studies had weak designs, but both were of high quality.

These cross-sectional studies reported that the health care system was impacted in two ways when not utilizing VC; one was through additional costs associated with patient transfers that were unnecessary, and another was an increased cost when using in-person visits in comparison to VC. Hofmeyer et al. (2016) reported that 511 transfers were avoided when

utilizing VC and because of this, the health care system in the US saved approximately 5 million US dollars. These findings were supported by Lovell et al. (2021) who found statistically significant increased financial costs when utilizing urgent care visits ($661, $p<0.001$), in-person primary care visits ($707, $p<0.001$), or emergency department visits ($3403, $p<0.001$) in comparison to VC visits ($429).

Although the cross-sectional study by Lovell et al. (2021) was not conducted in a rural area, the additional financial costs reported for the health care system by not using VC would be applicable in a rural or urban setting. In addition to VC being a less expensive, more feasible option for conducting health care visits, it also has the potential for decreasing unnecessary patient transfers to other hospital sites for continuing care. These avoided transfers result in financial savings for the health care system and can save the patient from the stress of transfer out of their community.

Contributing Factors that Prevent the Regular Use of VC

The literature has shown that the incidence of VC remains lower among those in rural communities despite the encouragement for VC use from the COVID-19 pandemic. After discussion of the impacts that VC use can have for patients and the health care system, further investigation must be conducted on the factors that contribute to the lower use of VC in rural areas to inform the interventions needed to promote increased use of this service.

Financial Concerns

Three studies found that costs for patients and the health care system were barriers to the initiation of VC visits. Two of these studies were systematic literature reviews that were conducted with the aim of identifying factors that impacted the acceptance and use of VC (Bokolo, 2021; Woo & Dowding, 2018). Bokolo (2021) included 35 articles or reviews in their

review, most of which used secondary data sources and included grey literature documents which were published during 2020. All addressed the factors that contributed to reduced use of VC during or after the COVID-19 pandemic. Woo and Dowding (2018) included five studies in their review, two mixed method, two qualitative, and one randomized controlled trial (RCT), that were published between the years 2001 and 2014. These studies all focused on the factors impacting VC acceptance by heart failure patients. Although both systematic reviews were able to provide strong evidence, only Bokolo's (2021) study was rated as high quality. The systematic review by Woo and Dowding (2018) was a medium quality study since only five studies were included and three of these were described as having low quality.

Bokolo (2021) identified financial barriers at the health care system level. These included the initial cost of developing the VC platform, purchasing start up equipment, having information technology (IT) support, and that additional jobs required for training of the appropriate staff. Woo and Dowding (2018) supported these findings with two studies from their review. They discussed the initial cost for patients when purchasing VC devices and maintenance costs for the health care system.

The third study that addressed financial barriers was a cross-sectional study that evaluated VC readiness among elderly adults in the US (Lam et al., 2020). The researchers involved in this study evaluated data on 4525 adults over the age of 65 years and used these results to estimate the level of preparedness for using VC across the country for the elderly. Data were collected on patient demographics, physical or cognitive disabilities that may impair VC use, availability of a camera-capable device with internet access, education level, and income level. Despite the weak design of this research study, the overall study quality was high and there was a clear association between income level and VC readiness. Study participants who fell in

the lowest income category (less than $18,000 for single households and less than $30,000 for joint households) had the highest percentage of individuals who were unprepared for VC (67%, adjusted odds ratio: 3.2, 95% CI [2.2-4.6]).

The findings from both systematic reviews (Bokolo, 2021; Woo & Dowding, 2018) and the cross-sectional study (Lam et al., 2020) all provided supporting evidence that VC has significant start-up costs that can prevent patient acceptance or use. This barrier increases for individuals who have lower incomes which can make purchasing or updating devices capable of VC nearly impossible. Additionally, costs for the health care system to begin VC may require funding approval and be a barrier that can take time to overcome. These studies were not conducted specifically in rural areas, but financial barriers are an issue that pertains to both urban and rural populations. The focus of the study by Lam et al. (2020) on elderly individuals is highly generalizable to rural populations since these areas often have a higher proportion of elderly individuals.

Technology Barriers

Eight studies reported technology issues as a barrier to successful VC use. One was the systematic review by Woo and Dowding (2018) that was previously described, four were cross-sectional studies (Gardner et al., 2015; Hawke et al., 2021; Lam et al., 2020; Layfield et al., 2020), one was a qualitative research study that utilized semi-structured interview questions (Powell et al., 2017), one used a mixed method approach (Greenhalgh et al., 2018), and one was an uncontrolled before and after (UCBA) study (Slightam et al., 2020). Two cross-sectional studies evaluated the perceptions of VC during the COVID-19 pandemic; one had 409 individuals aged 14 to 29 in Ontario that used mental health VC services (Hawke et al., 2021) and the other had 100 patients who used VC services at a head and neck surgery practice in

Philadelphia, US between March 25, 2020 and April 24, 2020 (Layfield et al., 2020). Gardner et al. (2015) surveyed 263 participants who visited an institution in Minnesota, US prior to the COVID-19 pandemic on their perceptions of VC use. The fourth cross-sectional study was previously described and evaluated 4525 adults over 65 years of age to determine their level of preparedness for VC (Lam et al., 2020). The qualitative phenomenology study by Powell et al. (2017) used semi-structured interviews for data collection to understand the experiences of 19 patients that used VC for primary care visits in a clinic in Philadelphia, US.

The remaining two studies aimed to understand the experiences associated with the implementation of VC services. The mixed method study by Greenhalgh et al. (2018) collected data on VC in the outpatient setting; the quantitative research methodology included cross-sectional data on the VC visits and type of discussion that occurred in the visit, and the qualitative research had an action research methodology that utilized semi-structured interviews, video and audio taped consultations, and analyzed documents from the clinics involved and from a national level. The UCBA study by Slightam et al. (2020) supplied tablets and technical support to veterans to promote the use of VC. Participants were referred to the study by their healthcare provider and baseline and follow-up surveys were conducted to evaluate patient demographics, the satisfaction with VC, and their previous experience with technology.

The systematic review by Woo and Dowding (2018) provided strong evidence but had medium quality as previously discussed. All four of the cross-sectional studies had a weak design but were high quality studies that provided important insight on patients' perceptions and experiences with VC. The UCBA was also a weak study design but had medium quality due to the low response rate (36%) of participants who completed the baseline and follow-up surveys which increased the possibility of an information bias. The cross-sectional study design featured

in the quantitative focus of the study by Greenhalgh et al. (2018) was a weak study design with low quality. There was no clear description or discussion of the statistics for the quantitative findings. The qualitative focus of the same study was of medium credibility since the thematic analysis process was not adequately described and it was unclear if the themes derived were validated with other researchers or the participants. Triangulation of the data was used which did increase the study's credibility. The qualitative study by Powell et al. (2017) was highly credible since the data collection procedures were clear and two researchers conducted the interviews, transcribed responses, coded data, and agreed on the emerging themes to ensure biases were reduced. One limitation with this study was that participants were selected from clinics that had previously established VC visits, therefore experiences with the initial use of VC may not be adequately represented.

All five of the studies included in the Woo and Dowding (2018) systematic review reported technology concerns regarding the VC platform or that equipment utilization influenced the patient's choice to use VC. Similar findings were reported by Layfield et al. (2020) from participants who felt the reliability of technology was the least favorable aspect of VC. They rated technology reliability as an average of 4.86 (SD=0.84) on a scale of one to seven, which was the lowest average score among the five aspects of VC that were evaluated. Greenhalgh et al. (2018) found that between 2% and 22% of visits conducted among three hospitals in London, UK were utilizing VC at the conclusion of their study. The researchers noted that technology concerns were the reason that providers or patients were not using VC, citing that some VC visits were "technically unachievable" (Greenhalgh et al., 2018, p. 1). Hawke et al. (2021) also found that participants were reluctant to use VC because of anxiety and uncomfortableness with the VC platform but no specific statistics were provided on the number of participants who felt this way.

Furthermore, patients were more likely to accept and participate in VC visits if they were comfortable and had previous experience with similar technology as opposed to those who did not have the same comfort level with technology use (66% vs. 9%, $p<0.0001$) (Gardner et al., 2015).

One of the cross-sectional studies (Lam et al., 2020) and the qualitative study (Powell et al., 2017) had similar findings that indicated technological barriers existed prior to or at the beginning of the VC visit. Powell et al. (2017) reported issues with passwords and codes that were required for login or start-up of the VC visit, while Lam et al. (2020) estimated that 13 million adults over the age of 65 living in the US were not prepared for VC visits due to their difficulty and inexperience using technology. Even when older adults had support from a family member to aid in using VC in their home, it was estimated that 10.8 million (32%) were still unprepared for VC visits. Slightam et al. (2020) supported this with findings from the baseline survey in their UCBA study. The level of technology use prior to enrolling in the research study was rated as an average of 2.8 (SD=1.9) out of 8 on a Likert-type scale indicating that participants were inexperienced with technology use.

Ultimately, the studies identified in the literature found an association between the experience and comfort level patients had with technology and the acceptance or willingness to participate in VC. Although the weak designs mean that a causal association cannot be determined, the association found suggests action to increase comfort with technology should be explored. Despite these eight studies being conducted among patients with different medical conditions and in urban areas, their results are applicable to any VC users as they addressed the difficulty that some patients have with understanding the technology that is required to navigate the VC platform. Since rural areas often have an aging population, the cross-sectional study by

Lam et al. (2020) was the most generalizable to rural populations in NL. This study provided key findings that can be applicable to older adults living in rural NL as they may likely face similar issues as the participants in this study. These findings indicate that for VC to be utilized in rural or elderly populations, considerable effort must be made to ensure patients are comfortable with VC technology use prior to encouraging VC visits.

Lack of Awareness of VC

Through review of the literature, it became apparent that some patients were unaware that VC existed or that it was an option available to them. Three studies provided evidence that awareness of VC services impacted the use of VC. Two of these studies used mixed methods (Palcu et al., 2020; St. Clair & Murtagh, 2019) and one was a cross-sectional study (Polinski et al., 2015). The two studies that utilized a mixed method design featured a cross-sectional quantitative component with a semi-structured interview as a qualitative component. The aim of all three studies was to understand patient experiences and level of satisfaction with VC prior to the COVID-19 pandemic. The cross-sectional portion of each study was conducted using a survey among various populations. St. Clair and Murtagh (2019) surveyed 283 residents of Australia with the majority (83%) residing in a rural area. Polinski et al. (2015) surveyed 1734 patients who agreed to use VC at one of the eleven clinics established throughout California and Texas, US. Palcu et al. (2020) surveyed 69 patients who utilized VC between 2013 and 2018 at the Women's College Hospital in Toronto, ON. The qualitative portions of the mixed methods studies were semi-structured interviews that were completed by a 30-minute phone interview with 15 participants (Palcu et al., 2020) and by either phone or in-person interview with 12 participants (St. Clair & Murtagh, 2019).

Three of the cross-sectional designs were weak designs with two being medium quality (Palcu et al., 2020; St. Clair & Murtagh, 2019) and one being low quality (Polinski et al., 2015). The cross-sectional study by Polinski et al. (2015) was given a low-quality rating since there was a significant amount of missing data that made the response rate unable to calculate, the questionnaire was not tested for validity and reliability, and the data collection process was not consistent. The remaining two studies were given a medium quality rating since Palcu et al. (2020) had a very low response rate with only 69 participants included from 236 surveys that were mailed. Although St. Clair and Murtagh (2019) had a higher response rate with 283 surveys being completed, the surveys featured a significant amount of missing data that the researchers accounted for as 'survey fatigue'.

The qualitative components of the mixed methods studies were deemed as high (Palcu et al., 2020) and medium (St. Clair & Murtagh, 2019) credibility. Palcu et al. (2020) used a thematic analysis approach after the interviews were conducted and there was a clear description of how the results were analyzed with biases being reduced since two researchers coded the data and the emerging themes were discussed with the entire research team. Although St. Clair and Murtagh (2019) used respondent verification from notes taken during the interview, the credibility of the study was impacted since there was no discussion on the achievement of data saturation or the reduction of researcher biases. In addition, the data analysis process was not clearly described.

From the survey portion of one mixed methods study, 74% of respondents had previous knowledge about the VC service, but only 64% of respondents were aware that VC was available to them (St. Clair & Murtagh, 2019). Palcu et al. (2020) had similar findings from the qualitative interviews that both rural patients and physicians had a lack of awareness of the VC service, with

some participants requesting that their health care providers should be offering this service to their patients. In addition, it was found that those who were aware and understood VC were 2.8 times more likely to be satisfied with their VC visit (OR=2.80, 95% CI [1.81, 4.32]) (Polinski et al., 2020).

The awareness of VC availability to patients is a key factor in the use of VC since patients cannot use the service if they are unaware of its availability. The cross-sectional component of St. Clair and Murtagh's (2019) study was highly generalizable to the rural population of interest in NL and their findings suggested that most residents (64%) were unaware that VC was an option in their area. Additionally, one of the qualitative themes identified by Palcu et al. (2020) described the unawareness of VC specifically in rural patients and providers. These results indicated that an extra effort may be required in this population to ensure they are aware that VC is an option in their area. Although an association was made between VC awareness and VC satisfaction in one study, these results should be interpreted with caution due to the weak study design in combination with low overall quality.

Lack of Adequate Internet Connection or Devices

Patients have reported throughout the literature that a reliable internet connection and access to a camera-capable device are factors that inhibit VC use. Four studies found internet connection difficulties were a concern that prevented VC use, two were systematic literature reviews (Bokolo, 2021; Woo & Dowding, 2018), one was a cross-sectional study (Hawke et al., 2021), and one was a mixed methods study (St. Clair & Murtagh, 2019) that used a cross-sectional design and conducted semi-structured interviews. In the cross-sectional study, Hawke et al. (2021) conducted a survey on patient experiences with VC among 409 randomly selected individuals aged 14 to 29. Data was collected between August 7 and 30, 2020 from individuals

who participated in VC for mental health and/or substances abuse services. This study had a weak design but was high quality. The designs and quality of the remaining three studies have been discussed in previous sections.

A reliable internet connection is required for VC visit use. However, from the literature reviewed, it is apparent that not all participants have a readily available and reliable internet connection, and this gap appears to be greater in rural populations. From the 35 studies included in the review by Bokolo (2021), six studies noted that a reliable internet connection is a key factor in the success of VC visits. One of these six studies indicated that this barrier is most common in residents of rural communities. One of the five studies that used a mixed method approach in the review by Woo and Dowding (2018) found that participants were concerned about the internet connection prior to participating in VC. These findings were similar in the remaining two studies where participants who reported an inadequate internet connection and restrictions on data usage as barriers to utilizing VC (Hawke et al., 2021; St. Clair & Murtagh, 2019).

The second factor identified as a concern, the lack of a camera-capable device, was found in two cross-sectional studies (Gardner et al., 2015; Padala et al., 2020). Both studies aimed to understand the factors that impacted the capability and willingness to participate in VC through use of a phone survey. Gardner et al. (2015) surveyed a random sample of participants over the age of 18 that attended the outpatient department between July 1, 2011 and July 31, 2012 at a hospital in Minnesota, US. In comparison, Padala et al. (2020) conducted surveys among elderly veterans (mean age=72.6 years) who had an appointment at one of six clinics in Arkansas, US within a four-week period (n=118). Both cross-sectionals were high quality studies despite their weak designs.

Among the veterans included in the cross-sectional study by Padala et al. (2020), most had internet access (77%). However, only 56% had a camera-capable device that was appropriate for partaking in VC visits (Padala et al., 2020). Similar rates were described by Gardner et al. (2015) where 75% of participants had internet access, but only 57% felt that their current device was adequate for conducting a VC visit. A statistically significant relationship was identified between the availability of internet access, area of residence, and education level (Padala et al., 2020). Those who lived in a rural area were less likely to have internet accessibility than urban residents (28 rural vs. 63 urban, $p=0.045$) and those who did not complete high school were also less likely to have internet access ($p=0.03$). Ultimately, Padala et al. (2020) found that those who lived in rural areas were less likely to be willing to use VC (19 rural vs. 50 urban, $p=0.03$).

Although the designs used do not allow determination of a causal association, the lack of a secure and reliable internet connection paired with the lack of devices capable of VC appear to be significant factors that prevent the use of VC. Among the six studies included, two studies were conducted among rural residents (Padala et al., 2020; St. Clair & Murtagh, 2019) and one of these specifically with an elderly population (Padala et al., 2020) which was highly generalizable to the rural populations in NL. The findings among all studies concluded that reliable internet access and devices capable of VC are not available to all individuals who may benefit from VC services. Furthermore, there are significant differences in internet and VC device availability between rural and urban residents. With rural residents having higher rates of poor or no internet access and a lack of VC-capable devices, their willingness and capability of using VC was significantly impacted.

Increased Age

Although age is a factor that is not preventable or alterable with any intervention, two

studies from this review found significant relationships between increased age and the willingness or ability to use VC. Both studies were cross-sectional studies that evaluated the willingness and capability of participants with VC (Gardner et al., 2015; Lam et al., 2020). The designs and quality of these studies have been previously discussed.

Both studies supported the relationship that higher age was associated with increased unwillingness to participate in VC. The age of participants who reported they were willing to use VC was significantly lower than those who reported they were unwilling to use VC (mean age=55.4 years vs. mean age=64.1 years, p=0.0002). Lam et al. (2020) supported these findings as they found that VC unreadiness increased as age increased with 25% of participants between age 65 and 74 being unready, 44% of those between the ages of 75-84 were unready (adjusted odds ratio=2.3, 95% CI [1.8-3.0]), and 72% of those above 85 years were unready (adjusted odds ratio=7.0, 95% CI [5.3-9.1]).

Both studies that reported these age-related findings were not specific to rural populations as they were inclusive of participants regardless of their geographic location. Therefore, the results are unable to be generalized to rural communities. However, this does not lessen the importance of the findings. Since rural communities have aging populations where most residents are elderly, the findings from these studies indicate that the rural population in NL may have a similar unwillingness or unreadiness to participate in VC. Therefore, to lessen the impact of age on VC unwillingness among the aging population in rural communities, extra initiatives may be required to support these individuals.

Interventions to Support VC Implementation

Several factors have been identified that inhibit VC use for patients and/or providers. However, it is imperative that we understand if any interventions have been utilized to support

patients or providers in overcoming these factors. Previously conducted interventions, either successful or unsuccessful, can provide key information on how to proceed in the future to promote an increased use of VC services. In the following section, two studies will be discussed where an intervention was conducted to overcome factors that contributed to the low use of VC. There were three categories of interventions that will be discussed with the first two categories having evidence from only one study each and the third category having evidence from both studies. These include providing VC capable devices, VC training for healthcare providers, and technology support for patients and providers. Additionally, other articles will be discussed in which authors make recommendations for the successful initiation of VC services; however, the evidence base for the recommendations was unclear in these articles.

Providing VC Capable Devices

One factor that contributed to the low use of VC was the inability to access camera capable devices to use VC. An uncontrolled before and after (UCBA) study provided tablet devices to veterans who identified as having barriers that prevented them from accessing healthcare services (Slightam et al., 2020). Participants were referred to the study by their healthcare provider who recognized that barriers were present. In addition, technical support was provided by telehealth coordinators and the National Telehealth Technology help desk. Baseline surveys were sent between April 1, 2017 and September 30, 2017 to 2120 veterans who received a camera capable device during that time. Follow-up surveys were sent after three to six months and evaluated participants' experience with the device and with the VC service. From the 2120 participants who received devices during the study period, 1321 returned the baseline survey, and from these participants 763 completed the follow-up survey (36% response rate). The UCBA

study was a weak design for establishing a causal association that had medium quality. The low response rate (36%) at the completion of this study created the possibility of an information bias.

Supplying a VC capable device is an intervention that overcomes a technology access barrier for patients. When analyzing the participant responses from the baseline and follow up surveys, Slightam et al. (2020) found that patient reported satisfaction increased significantly from an average 7.4 to 7.9 ($p<0.001$). In addition, 86% of the participants were likely to recommend VC to others. Participants were very satisfied with the VC visits they attended as 67.8% of participants reported at follow-up that their preference was the same or higher for VC in comparison to in-person visits. It is important to note that participants who were less likely to report these findings were greater than 65 years of age (adjusted odds ratio 1.65, 95% CI [1.09-2.51], $p=0.02$).

It has been previously discussed that lack of access to VC capable devices is a factor that has contributed to the low use of VC. This factor has been noted to be increased in rural areas where the population are more likely to be of increased age and a lower financial income. The intervention implemented by Slightam et al. (2020) was one that attempted to eliminate this barrier by providing veterans tablet devices to use for their VC visits. The population of this study consisted of individuals with an average age of 56 years and had half of the participants (54.6%) living in a rural area, making this study highly generalizable to the rural population of interest for this project. Although most participants reported their satisfaction with VC after being provided with a camera capable device, the participants over the age of 65 remained resistant to the transition to VC and continued to report their preference for in-person visits. Since many rural communities have an aging population, this indicates that the provision of

devices will not be enough to promote an increased use of VC in these areas and that further support is necessary.

VC Training for Healthcare Providers

A previously discussed barrier to the use of VC services was a lack of awareness of the availability of VC or how to use the service. One cross-sectional study implemented a staff training intervention among 2374 healthcare providers who would receive VC certification at the completion of the training (Esper et al., 2020). The goal was to promote successful initiation of VC in an outpatient setting. This training process was conducted between March and May 2020 when VC services had to be implemented rapidly due to the beginning of the COVID-19 pandemic. Data collection was simultaneously conducted over this time on two outcomes, the number of VC visits conducted in the outpatient department, and the financial impact of this switch to VC. This cross-sectional study had a weak design for establishing causation with medium quality. The researchers failed to provide an adequate statistical analysis of the study results which directly impacted the quality of the study.

Esper et al. (2020) found that VC services could be successfully implemented by providing adequate training and certification for staff. After the training process began for staff, the number of VC visits that occurred continued to increase throughout the study period. At the conclusion of data collection in May 2020, 84% of all visits were VC visits that utilized video consultations and only 16% were conducted by phone (Esper et al., 2020). Direct costs of VC services were also recorded and evaluated during the study period. It was noted that $14.6 million was spent on VC services during that time. However, it was unclear if this amount had increased or decreased as no discussion was held on the financial expenses prior to the study intervention.

The cross-sectional study by Esper et al. (2020) was conducted among healthcare providers in an urban setting in Georgia, US and thus, the study cannot be generalized to a rural community setting in NL. However, it is important to note the increase in VC visit numbers after healthcare providers were trained and certified in VC. Unfortunately, due to the weak design and medium quality of this study, it is unreasonable to make the association that increased staff training directly results in an increase in VC visits. Despite this lack of strong evidence, any increase in training and awareness for staff has the potential to result in increased awareness for patients as well.

Technology Support for Patients and Providers

Technology barriers among patients and healthcare providers have been identified throughout the literature. The two interventions previously described discussed technology support as a critical factor required for the successful implementation of VC services. The researchers had technical support available in addition to their initial intervention. The UCBA study by Slightam et al. (2020) focused on technology support for patients, while the cross-sectional study by Esper et al. (2020) focused on support for providers. In the UCBA study, participants had access to technical support from local telehealth coordinators and the Veterans Affairs National Telehealth help desk in addition to receiving a camera capable device (Slightam et al., 2020). Participants could contact these services as needed for assistance with technical concerns or issues with operating their device. Esper et al. (2020) implemented training for healthcare providers and utilized a hub-and-spoke model to provide support during the rapid implementation of VC services at the beginning of the COVID-19 pandemic. The ‘hub’ of the model was made up of a small VC team and each ‘spoke’ was a specific practice or division that

was centered around the hub. Communication and support occurred directly between the hub and spoke. In depth discussion of both study designs and quality is featured in previous sections.

The effectiveness of technical support for patients was evaluated in the UCBA study by Slightam et al. (2020), while the cross-sectional study by Esper et al. (2020) noted the importance of providing support for healthcare providers but had no direct evaluation of this system. Slightam et al. (2020) reported high patient satisfaction with the technical support provided in this study. In the follow up survey, most patients were highly satisfied with being able to receive the assistance they needed when navigating the VC platform (86%). They felt that help was easy to obtain (87%), and it was easy to ask the questions they needed regarding the technology (88%). As discussed previously, Slightam et al. (2020) reported an increase in the overall patient satisfaction and the likelihood of recommending VC visits to others. Esper et al. (2020) emphasized the hub-and-spoke model as an important factor in the success of rapid VC implementation during COVID-19. The direct communication between two parties (the hub and the spoke) enabled the hub team to understand one practice's problems and provide problem solving for that area while building knowledge to support others if they had a similar problem. This method of communication promoted prompt feedback for healthcare providers and resulted in improvements to the VC service. Screen sharing was one of the types of technical support provided to patients that was deemed as important. Although Esper et al. (2020) concluded that a hub-and-spoke model was an important factor in the success of implementing VC services during the COVID-19 pandemic, there was no statistical analysis to support these claims of effectiveness.

Providing technical support for patients or providers at the start-up of a new service such as VC is very important to ensure the recipients have success with the program and know where

to find assistance if necessary. While the cross-sectional study by Esper et al. (2020) is unable to be generalized to a rural population due to the study setting, the UCBA study by Slightam et al. (2020) is highly generalizable to a rural area and does provide evidence that support for patients aids in the success of the VC visit. Despite the study having an overall medium quality due to the low response rate, the follow up survey indicated that those who did respond were very satisfied with the technical support and the ease of obtaining answers to their questions when needed. Although the conclusion should not be drawn that providing technical support for patients will result in successful VC use, it is important to note that having technical support available for patients can increase the possibility that patients will navigate the VC platform with ease when otherwise technical difficulties may result in cancelled VC visits.

Additional Recommendations

From a review of the literature three additional reports were retrieved that gave recommendations on how to support a successful transition to VC. These reports did not conduct a specific intervention among patients or providers. However, they based their recommendations on their prior experience with VC in combination with supporting literature. Since there are very few studies that conducted interventions to overcome the barriers that prevent an increased use of VC, it is important to consider recommendations made by researchers who have prior experience with VC.

Three reports gave recommendations for the increased use of VC. These included one narrative literature review (Schwamm, 2014), one mixed method study (Greenhalgh et al., 2018), and one report of the developmental process of an informative care package to support patient use of a medication management application (Hill et al., 2021). The narrative literature review included 36 articles published between 1996 and 2013 (Schwamm, 2014). The articles were

comprised of RCTs, cohort studies, systematic reviews, meta-analysis, and documents from grey literature. Despite using a variety of articles over a large period of time, no critical appraisal was reported so the quality and strength of the evidence was unclear which limited the ability to draw conclusions.

Greenhalgh et al. (2018) described their report as using a mixed method approach. However, there was limited information provided on the quantitative methods or results in the study design and no integration of quantitative findings with qualitative findings. Therefore, the focus during this review will be on the qualitative findings that utilized an action research approach. The researchers evaluated the implementation of VC in an outpatient setting for diabetes services, diabetes antenatal services, and cancer surgery among three hospitals in London, UK between 2015 and 2017. Data were collected through semi-structured interviews with stakeholders, staff, and patients, through observations with field notes, and through review of documents such as policies and national announcements. In total, semi-structured interviews were conducted with 36 national stakeholders and 24 staff, 300 hours of consultation observations, data on 30 VC consults with 17 in-person recordings to match the VC visit clinical condition, and field notes from patients' homes and the clinic. The third report was by Hill et al. (2021) who described the developmental process of creating a care package to support the shift to VC at the beginning of the COVID-19 pandemic. The goal of this study was to promote the use of a medication management app via smartphone and assess its effectiveness. Forty-nine participants over the age of 60 years from Indiana, US were enrolled in the study and initial care package delivery began on April 16, 2020, with information on how to use the medication app. Devices were given to those who did not have them and a total of 21 care packages were sent out to participants. Care packages were delivered every two weeks and included different types of

information depending on the patient need. Feedback was obtained through usability assessments via mail or phone. However, the researchers did not report the specific results, had no statistical analysis of these findings, and patient satisfaction was not discussed.

The developmental process report conducted by Hill et al. (2021) was low quality. Although the researchers conducted an intervention in the form of care package development and delivery to participants, they had no discussion or statistical analysis on the effectiveness of this intervention, or the satisfaction reported by patients. The qualitative component of the report by Greenhalgh et al. (2018) had medium credibility. The researchers used thematic analysis at the macro level of the qualitative data analysis process. However, there was minimal discussion on how themes were derived from this process. It is unclear if the themes were validated by other researchers or by the participants. Triangulation of the data was used by conducting interviews, policy analysis, and observations of VC interactions, which added credibility to the study findings.

From the three reports discussed here, common recommendations for successful integration of VC included technical support and VC information to promote awareness for both patients and providers. Each report discussed different types of support they felt was effective. Schwamm (2014) made several recommendations for VC success that all pertained to information and awareness of VC for patients and providers. They felt that patients should understand that information shared through VC will remain private and secure, patients and providers should ensure they have a quiet and private place to conduct their VC visit, and they should be open to the possibilities and aspects of VC that can become available to them. Greenhalgh et al. (2018) and Hill et al. (2021) described technical support to be very important for patients and for providers at an organizational level. Hill et al. (2021) went on to recommend

screen sharing and support delivered by phone or email, while Greenhalgh et al. (2018) recommended that technical support can overcome an existing barrier of low literacy levels. Interestingly, Greenhalgh et al. (2018) also noted a pre-existing relationship between a patient and their healthcare provider was an important factor in the success of the VC visit. Despite the reasonable recommendations made from all three reports discussed, they all have unclear evidence to support their findings. As a result, no clear association can be made between any of the recommendations made by these researchers and the success of VC.

Two of the reports discussed (Greenhalgh et al., 2018; Hill et al., 2021) were both conducted in urban areas and are not able to be generalized to the rural population of interest for this project. Due to the narrative literature review having low quality and no characteristics of the target rural population, it is also unreasonable to generalize these findings to a rural population. Although these three reports gave recommendations for technical support and VC information to promote patient and provider awareness, it is important to note that a clear conclusion was not drawn due to the lack of supporting evidence. This indicated that these recommendations can be considered when implementing VC in rural communities but should be further supported with higher quality studies that have statistically significant relationships identified between technical support or VC information for awareness and increased VC use or patient satisfaction.

Summary of Interventions

In summary, very limited research exists on the interventions conducted to support the transition to VC use and therefore, very limited conclusions have been drawn regarding their effectiveness, or if one is more effective than the other. VC continues to be underutilized in urban and rural areas. However, rural areas have additional barriers and complications when promoting the use of VC. While the intent is to increase the use of this service there are few

studies that have generated evidence on which to base strategies to promote the increased use of VC. A common theme throughout the two interventional studies, as well as the three reports that gave recommendations focused on technical support and information for patients and providers. Therefore, a logical conclusion is to implement education to providers and patients as a strategy to support and evaluate this service to address the current issue and add evidence to the literature. This education will be further supported by Knowles' adult learning theory and will be discussed in detail in the following section.

Knowles' Adult Learning Theory to Support Learning in VC

When implementing education to a group, the learner should be considered to ensure an optimal learning experience for all those involved. For this practicum project, the intended education will be geared toward adult residents of the rural community of Burgeo and the surrounding coastal communities. When a learning theory can be applied to the teaching/learning situation, there is a greater likelihood of having positive learning outcomes (Candela, 2020). After careful consideration of the nursing learning theories in combination with the target population for education delivery, it is reasonable to apply the principles of Knowles' adult learning theory (ALT) when implementing education to this population.

As described by Candela (2020), the ALT is a type of cognitive learning theory where the learner's experiences in life and maturity level impact how they learn. Adult learners tend to learn differently than children and therefore, may require different teaching strategies to ensure an optimal learning outcome. Adults are motivated to learn when the content is relevant to them and viewed as important for solving problems in their environment. For the population of adults who will be targeted in this project, the importance of receiving high quality, easily accessible health care while staying in their home should be conveyed. When they can understand how VC

can save them time and money, they may view the information as relevant to them in their area and be more open to the learning experience.

As noted previously, technology barriers and awareness of VC were highly described in the literature and are key components that should be focused on when educating a population with the goal of increasing the use of VC. Although interventions for education on VC use were not supported with high quality evidence in the literature, the studies that were included provided technical support and information on VC use for both patients and health care providers and noted that this was an essential component in increasing satisfaction and the use of VC. Therefore, the learning on VC should be focused on how to successfully set-up a VC visit and navigate the VC platform to engage them in completing a task and troubleshooting tips to ensure they can problem solve during their visit if needed.

The ALT described adults as being self directed learners who prefer to focus on completing a task or solving a problem (Candela, 2020). To engage the learners from the target population, they should be able to complete the learning at their own pace. Therefore, providing a package with information about VC and how to use the VC platform would allow them the discretion to complete the learning at their desired pace.

Grey Literature to Support VC Use

Several grey literature sites were searched for information relevant to the use of VC in rural areas. The goal was to determine if any professional regulatory bodies or health organizations had existing information or had implemented any intervention for patients or healthcare providers to promote the increased use of VC. From this search two sites were found that gave suggestions for successful VC use (Canadian Partnership Against Cancer [CPAC],

2019; Stewart, 2020) and one site contained information and resources for patients and providers (Newfoundland and Labrador Centre of Health Information [NLCHI], 2020).

The CPAC (2019) report was an environmental scan that addressed the use of VC in the country prior to the COVID-19 pandemic. Several challenges and barriers were identified along with possible solutions to overcome these barriers when implementing VC in practice. Throughout this report the trends of VC use were given and interviews were conducted with 18 key informants on VC use and its challenges. Minimal information was given regarding the methodology used for conducting these interviews which negatively impacted the quality of the results. There was an in-depth discussion of the information gathered from this process, but no statistical analysis was conducted. The report published by the CNA highlighted key information from the VC playbook that was written to aid physicians in the transition to VC during the COVID-19 pandemic (Stewart, 2020). This report was entirely narrative, and the information discussed brought awareness to aspects of the VC program for registered nurses (RNs) who may use VC in their practice. The NLCHI (2020) provided information and resources for patients and providers on how to prepare for and participate in a VC visit in NL.

From the stakeholder interviews conducted for the environmental scan by CPAC (2019) technology issues were reported by 5 out of 18, while 9 out of 18 stakeholders reported the VC platform was not well integrated with other systems that allowed for ease of use (CPAC, 2019). The CPAC (2019) had multiple suggestions to overcome the barriers identified with this service. They suggested that integrating VC platform into the patients' current electronic medical record (EMR) would ensure the platform is easily integrated between systems. In addition, they suggested patients and providers should be educated prior to taking part in a VC visit to minimize the lack of awareness regarding VC. They also encouraged the use of VC coordinators

to minimize the extra workload for support staff. The second grey literature site focused on tips to ensure providers conducted a safe, confidential VC visit (Stewart, 2020). These included to ensure all patients gave verbal or written consent to participate in VC, to ensure VC providers had a large screen with a high-quality camera and speakers, and to ensure that both parties were able to participate in the visit in a quiet, private area. It was also noted that certain conditions or concerns should not be addressed with VC, including any chest pain or shortness of breath, ear pain, cough, or recent injury. The third site searched for information was the NLCHI (2020) who featured resources for patients and providers on how to ensure they had adequate technology to conduct the VC appointment, how to prepare for a VC visit, and had training resources that contained visual diagrams on how to sign on to a VC appointment. This website also contained links to the VC playbook at the Canadian Medical Association (CMA), the NL medical association (NLMA) VC website.

All three websites discussed gave reasonable suggestions for the implementation and continued success of VC among patients and providers. While the CPAC (2019) and Stewart (2020) gave suggestions toward implementation at the organizational level and for the safety of providers, the NLCHI (2020) focused on the information necessary to ensure patients and providers were prepared for VC and their technology could conduct the visit. It is important to note that the rates of VC and some of the challenges identified in the report by the CPAC (2019) may not be an accurate picture of the current rates and challenges of VC use during the COVID-19 pandemic. Despite this the information provided can still be useful in developing resources for promoting VC in rural communities in NL. All three websites were relevant to VC use in Canada. However, the NLCHI (2020) was specific to VC use in NL and has resources that are highly relevant to VC use in rural NL.

Implications for this Project

After an in-depth review of VC, it is evident that this service has considerable barriers to implementation that are exaggerated in rural areas. Residents of rural communities appear to be hesitant to use VC even with the encouragement and focus on VC during the COVID-19 pandemic. The use of VC among rural residents was low prior to the COVID-19 pandemic and has remained low, while the use of VC in urban areas has surpassed rural VC use with their quick adaptation to VC. Several factors have been identified that contribute to the continued low use of VC. Some of these factors are prevalent in rural areas due to their composure of an aging population and often a larger portion of the population with a lower income. However, a major factor identified that contributed to the low use of VC was patient inexperience with technology and the resulting technical issues, indicating that patients may benefit by having an educational resource to support first-time users of VC in navigating the technology. Patients were uncomfortable, anxious, or intimidated by the VC platform or the equipment required to navigate the platform and educational resources may aid in increasing the patient comfort level in this area.

The interventions that have been implemented as an attempt to increase VC use are minimal, likely because the use of VC is being encouraged and studied very recently in the literature. However, with the five studies that were included in this review that discussed VC interventions the technical support for patients and providers paired with information for patient and provider awareness appear to have considerable impact on the use of VC. This suggests that providing written information on VC with visuals to guide the technology aspect of VC use may benefit patients when initially using VC. It is important to note that due to the lack of strong study designs with high quality results, no causal associations have been made from the

literature. However, due to the significant evidence provided that technical issues and uncomfortableness with technology use are a preventative factor in the uptake of VC, especially in rural areas, it is logical to implement interventions that will target this factor. Any intervention that increases patients' comfort level with technology equipment or the VC platform has the potential to result in increased and continued use of VC services.

Additionally, it is apparent that patient and provider awareness is a key factor in VC use. The literature has shown that patients are not using VC as they are unaware the option is available to them, and their healthcare providers are not readily offering or promoting this service. Since the NLCHI (2020) has developed informational resources on using VC at home for both patients and providers, this information can be adapted in the development of a resource to support those who have the option of using VC in rural areas.

Conclusion

When patients are aware of their ability to use VC at home and the cost, time, and travel savings that accompany the use of this service for rural residents, they may be more likely to request this service. Ultimately, more high quality research must be conducted to provide evidence to adequately support the interventions conducted to encourage VC. However, the importance of the suggestions made throughout the literature can be considered when developing a resource to promote and support VC use in rural areas. This includes the possibility of implementing a written educational resource to promote patient and provider awareness that will feature visuals to guide a first time VC user with technology use. These possibilities must be further evaluated through consultation and discussion with key informants. With the adequate support in place to increase patient and provider confidence with VC and assist them through any

difficulties with navigating the VC platform, there rests the higher possibility that patients may continue to use VC and be satisfied with the service.

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Appendix A1 Literature Summary Table
Key Question: What interventions have been conducted to promote the increased use of virtual care?

Study/Design	Methods	Key Results	Comments
Authors: Esper et al. (2020) Design: Cross-sectional Purpose: To describe how VC was rapidly implemented in Emory Healthcare (EHC) during the COVID-19 pandemic.	Participants: • 2374 healthcare providers • Setting: Outpatient departments from 11 hospitals in Atlanta, Georgia, US. Methods: • Healthcare providers attended training between March 10 and May 6, 2020. • Training was conducted with three modules that were completed with 1 hour for each. • Providers were required to pass a 10-question test and then attend in-person training. • Implemented a 'hub-ad-spoke' model where the hub was a smaller team, and the spokes were different sections or practices. Outcome Measures: • Number of outpatient appointments measured between March 16 and May 6. • Financial expense of VC measured between March 16 and May 6.	Increase in VC use: • Greatest increase in VC visits was noted after the first weeks of training. • 64,290 total VC visits occurred; 84% were audio or video visits and 16% were via phone. Financial Expenses: • A total of $14,662,967 was spent on VC visits between March 16 and May 6, 2020. • Noted that the successful implementation of VC within a 2-month period was largely due to the use of the hub-and-spoke model for support.	Strength of Design: **Weak** Quality of Study: **Medium** Limitations: • No statistical analysis provided to analyze the results. • Unclear if the financial expenses increased or decreased as no comparison made to expenses prior to training occurring. Generalizability: • Weak, study conducted with healthcare providers in an urban setting.

Study/Design	Methods	Key Results	Comments
Authors: Greenhalgh et al. (2018) Design: Mixed methods study: quantitative – cross-sectional data, qualitative – action research methodology Purpose: To identify the implementation process of VC services and any challenges that existed with it.	Participants: • 36 national-level stakeholders, 24 staff, and 50 patients. • Setting: 3 hospitals in London, UK. Methods: • Data collected over 28 months. • Quantitative methods: analyzed data the uptake of VC by staff and patients. • Qualitative methods: Outcome Measures: • Semi-structured interviews with 36 stakeholder and 24 staff. • Observations with field notes. • Review of policies and grey literature reports. • Data collected on 30 VC consults. • Field notes taken from patients' homes and the hospital setting.	Technical support was noted to be important for patients and providers at the organizational level. Technical support can overcome barriers related to low literacy levels. A pre-existing relationship between the patient and their healthcare provider was an important factor in the VC visit success. Between 2% and 22% of consult used VC at study completion. Reasons for not using VC included provider refusal, patient condition inappropriate for VC, VC was impractical, or technical barriers made VC 'unachievable'.	**Quantitative** Strength of Design: **Weak** Quality of Study: **Low** Limitations: • Limited information on the quantitative methodology, no statistical analysis of VC uptake, and no integration of quantitative and qualitative findings. **Qualitative** Credibility: **Medium** Strengths: • Triangulation of data was used. Limitations: • Used thematic analysis, but not clear on how themes were derived. Unclear if themes were validated with researchers or participants. Generalizability: Weak. This study was conducted in an urban area.

Study/Design	Methods	Key Results	Comments
Authors: Hill et al. (2021) Design: Developmental process evaluation Purpose: To conduct usability testing for a mobile technology intervention for older adults.	Participants: • 49 participants aged 60 and above who were enrolled in a previous study. • Setting: Indiana, US Methods: • 3 care packages were developed and delivered to participants (Type A_0, A_1, B, and C). • Care package delivery began April 16, 2020 and were delivered every 2 weeks along with a smartphone if the participant did not have one. • 21 care packages were sent out. • Feedback obtained through digital or paper usability assessments. Outcome Measures: • Feedback obtained through digital or paper usability assessments.	• 19 participants were invited to complete the usability assessment. • 10 out of 19 returned the short form assessment. • 8 out of 19 returned the long form questionnaire. Three key recommendations: • Screen sharing or screen control – used as a form of technical support for visual learners. • Telephone support – technical support provided by phone and can be used in combination with screen sharing for synchronous discussion. • Email – some participants preferred email contact to provide feedback and for questions.	Strength of Design: **Weak** Quality of Study: **Low** Limitations: • No discussion conducted on the feedback obtained from the usability questionnaire. • No statistical analysis of the feedback obtained. • No discussion or attempt to evaluate patient satisfaction or rates of VC usage during or after the care package was delivered. Generalizability: Weak

Study/Design	Methods	Key Results	Comments
Authors: Schwamm (2014) Design: Narrative literature review Purpose: To determine strategies for successful VC implementation.	Studies included: • 36 articles included, published between 1996 and 2013. • Articles included RCTs, cohort studies, systematic reviews, meta-analysis, and grey literature. Methods: • No critical appraisal was reported on any of the 36 included articles. Outcome Measures: • Articles were included if they supported a successful integration of VC in practice.	All recommendations were focused on providing information on VC and promoting awareness of the VC service. Patients should understand that any information or data shared will be kept private and confidential. Providers and patients should ensure a quiet, private place to conduct VC visits. This would ensure confidentiality.	Quality of Study: **Low** Limitations: • No critical appraisal used to support the evidence used for the strategies discussed.

Study/Design	Methods	Key Results	Comments
Authors: Slightam et al. (2020) Design: Uncontrolled before and after (UCBA) study Purpose: To evaluate veterans' preference for VC vs. in-person care after being supplied tablets.	Participants: • Convenience sample n=2120 received tablet and baseline survey between April-Sept 2017. • Participants were veterans with mean age 56 years, 82% male, and 55% in rural area. • Setting: US. Methods: • Baseline survey mailed with tablets between April and September 2017. • Participant used tablet for VC visits and had access to technical support and telehealth coordinator. • Follow up survey mailed after 3-6 months. • Monetary incentive offered for full completion of surveys. Outcome Measures: • Baseline survey prior to tablet use and follow up surveys after 3-6 months. • Survey questions a 10-point Likert style, developed from the 2013 Customer Satisfaction Index. • One open-ended question in survey. • Measured patient preference for visit type and satisfaction with tablet program.	**Increased Satisfaction with Health Care:** Overall care • mean=7.4 to mean=7.9, p<0.001; n=706 • 86% would recommend VC for health care visit. **Visit Type Preference:** • Future visits by VC (32.1%) • Future visits in-person (31.8%) • No preference (35.7%) More likely to prefer VC if they felt uncomfortable in-person (AOR: 2.22; 95% CI 0.88-2.26; p<0.001). Less likely to prefer VC if they have greater number of comorbidities (AOR: 0.88; 95% CI 0.78-0.99; p=0.03).	Strength of Design: **Weak** Quality of Study: **Medium** Strengths: • Large sample size. • Adequate power and statistically significant results. Limitations: • 36% response rate for follow up survey at 6 months. • Possibility of information bias. Generalizability: • Moderate. Large percentage of males, only 54.6% in rural area. Feasibility: • Moderate. Implementation can be very expensive.

Appendix B

The Development of a Resource to Support the Utilization of Virtual Care at Home in Rural Communities: A Consultation Report

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The Development of a Resource to Support the Utilization of Virtual Care at Home in Rural Communities: A Consultation Report

Consultations are an important aspect of resource development as those consulted can provide key information specific to the area of interest. The areas of interest for this practicum project are the rural communities located on the south coast of NL. After a thorough review of the literature, it was determined that health care providers who were employed in rural health care in these communities and those who were responsible for virtual care (VC) orientation and education across the province should be contacted. Through discussion with those involved in the use and management of VC services, information was gained on the barriers that exist for patients when accessing VC and any interventions that have been conducted to minimize these barriers. This consultation process was essential as this information could not be accessed through a literature review. For this practicum project, the VC at home service in rural areas was discussed to determine what current resources existed in this area and if there were any learning needs from patients or health care providers that required addressing.

In the following report, I will provide a discussion of the background for this practicum project, the participants included in the consultations, the data collection methods, management, and analysis, the ethical considerations, and the findings from the consultation interviews. Additionally, the findings will be summarized, and the implications of the results for this practicum project will be discussed.

Background

The focus of this practicum project is to develop a resource to promote awareness and understanding of the VC at home service that is available to residents of the rural communities on the south coast of NL. Residents can meet with their health care provider from their own

home using their computer or smartphone, but the service is very rarely used. This service has the potential for cost and time savings for patients and ultimately reduces the inequities that rural residents face when accessing health care services.

A literature review of this topic has identified that VC use is lower in rural areas despite its encouragement during the COVID-19 pandemic. Many factors contribute to the poor uptake of the VC at home service, including a lack of awareness of VC or its benefits (Palcu et al., 2020; Polinski et al., 2015; St. Clair & Murtagh, 2019), no access to devices capable of conducting VC visits (Gardner et al., 2015; Padala et al., 2020), poor internet connection (Hawke et al., 2021; St. Clair & Murtagh, 2019), or lack of understanding of the VC platform technology (Hawke et al., 2021; Lam et al., 2020). Therefore, it is important to ensure that rural residents are aware and understand the VC service prior to its use to maximize the potential for a successful VC experience. The literature review identified factors that were present throughout Canada and in other countries and has provided evidence to inform the consultation questionnaires. The information gathered from the consultations that occurred will be used in addition to information from the literature review to inform the development of the practicum project. The consultations will involve discussion with those who have experience in the orientation, implementation, and use of the VC at home service in NL.

The goal of the consultations for the practicum project are to determine what resources were used in the orientation of patients to VC at home and if they were effective.

The key objectives for these consultations were to:

1. Identify any barriers that exist in NL for patients prior to utilizing VC at home;
2. Identify interventions that were conducted to promote the use of VC;

3. Understand the details of any educational or learning resources that were used in the orientation of patients to the VC at home service;

   and

4. Determine the effectiveness of learning resources or interventions if they were used, by determining if patient satisfaction has improved or there was an increased use of VC from home.

Participants

A total of six interviews occurred in these consultations. Three of these six interviews were with health care providers employed in the rural environment where the resource will be implemented. These health care providers were selected for consultations to provide information on their previous use of VC with patients from their home. It was hoped that they would provide information on the issues they encountered when using the VC at home service with patients and be able to identify any barriers that would prevent the use of VC and suggestions on how to minimize these barriers.

Additionally, consultation interviews were conducted with three VC consultants who directly manage or evaluate the VC service in various areas across the province of NL. These individuals were chosen for consultation since they could provide key information with the uptake of the VC at home service across the province and any barriers that have been identified that prevented its use. They could also identify any resources they have used for VC orientation and/or implementation and what they found effective.

Initially, an email was sent to four healthcare providers and six VC consultants. Details were sent to these individuals about the practicum project and information about how they can contribute. This email invited them to participate by replying to set up a time for a discussion

regarding the VC service. A copy of the email of inquiry that was sent to the six VC consultants is found in Appendix B1. The email of inquiry that was sent to the four health care providers was slightly different and is found in Appendix B2.

Data Collection, Management, and Analysis

A total of ten individuals were emailed, and six responded that they were interested in participating in the interview (60% response rate). Each respondent was scheduled for a date and time convenient for the interviewer and the interviewee. Interviews were conducted between July 27, 2021 and August 5, 2021. Data were collected via interviews with a semi-structured interview guide. Two interviews were conducted with the VC consultants via telephone and the third via Microsoft Teams. The interview questions and prompts used to guide these three interviews are listed in Appendix B3. From the three health care providers employed in the rural health care setting, one was interviewed in-person as preferred by the participant and the remaining two were contacted via telephone as they were not in town to conduct an in-person interview. Interview questions are slightly different for these three participants and are described in detail in Appendix B4.

To ensure high quality data collection measures were followed, detailed notes were taken on paper and then copied to a Microsoft Word document. If any feedback was unclear, the participants were asked to clarify their responses immediately before proceeding to the next question. At the end of each interview, a summary of the responses given was reviewed with the participant to ensure that their responses were accurately depicted (Streubert & Carpenter, 2011b).

Data were managed by using Microsoft Word for storage of responses immediately after they were received. This information was password protected on an encrypted device in my

personal residence. As suggested by Streubert and Carpenter (2011a) a large amount of qualitative data should be stored using a computer program specific for qualitative data. However, with the small amount of qualitative data that was received for these consultations, a table for storage of the data in a Word document was sufficient.

Data analysis occurred using the technique of comparative content analysis. With this analysis process, data were analyzed as it was received and compared to the existing data (Streubert & Carpenter, 2011c). Data analysis was conducted without discussion of the themes with the practicum supervisor and themes were grouped together when similar concepts emerged. The concepts that were identified will be discussed later in this report.

Ethical Considerations

The Health Research Ethics Authority (HREA) screening tool was completed to determine if any permissions were needed prior to consulting with any of the individuals named in this consultation plan. From this tool it was decided that these consultations were exempt from an ethical review (see Appendix B5). The purpose of the consultations was to gain information from key individuals that would be used for improvement of the VC program. Since this met one of the criteria listed in the HREA, no ethical review was necessary.

To maintain a high ethical standard throughout the consultation process, each participant that was contacted through email was made aware that participation was voluntary. It was assumed that if the individuals responded to the email and requested to set up a time for discussion, that they agreed to be included in this project. To ensure that confidentiality was maintained throughout the consultation process, any information provided was stored in an email that is password protected and on a computer that is also password protected. This information was accessed by myself and my practicum supervisor. Additionally, when the information is

entered in a Microsoft Word document, no names or identifying factors was stored with the respondent data and the written notes were shredded and disposed. After the project is completed all emails and documents will be permanently deleted and/or destroyed by shredding.

Consultation Findings

All responses received from the consultation interviews were analyzed for similar themes or content using the comparative content analysis approach. With this data analysis technique, responses were analyzed and compared to one another as they were received to manage qualitative data (Streubert and Carpenter, 2011c). From this data analysis, the findings were grouped in three themes: VC barriers, educational resources or orientation strategies, and other strategies.

VC Barriers

All six participants agreed that patients in rural areas had additional barriers that impacted their ability to access health care services from their area, thus further reinforcing the need for an extra focus on understanding VC to minimize accessibility barriers. There were five main barriers that were discussed during the consultation interviews. These barriers were video VC not being offered to patients, a lack of patient awareness, lack of VC capable devices, difficulty using the technology required for VC, and a lack of bandwidth adequate for conducting VC visits.

All six participants reported that VC via telephone is a frequently used service for patients to connect with their health care provider from their home. However, the video platform VC service is not frequently used or offered to patients. All three of the health care providers that were included in these consultation interviews reported that they only used VC via telephone and did not offer the option of video VC to their patients. Two out of three VC consultants also

reported that health care providers in their region did not frequently offer the video VC option to their patients, while the third consultant was unaware of the services offered to patients and could not comment on this barrier.

Most participants felt that providers were not offering video VC as an option to patients and therefore patients are unaware of this option. A lack of patient awareness of the VC service was identified as another barrier that prevented patient use. Health care providers that do not offer VC as an option for their patients can contribute to the lack of awareness of VC services in their area. Five of six participants reported that no initiatives were implemented to increase patient awareness of the availability of the VC at home service. Health care providers can play an important role in increasing patient awareness if they promote and offer VC services to their patients. Furthermore, if patients were aware of the VC options available in their area, they can feel confident to ask their health care provider to conduct their visit using VC.

Another barrier reported by two VC consultant participants included the lack of VC capable devices available for patients who wish to use VC. However, one VC consultant disagreed with these statements and felt that in previous years the lack of devices was a barrier, but currently most patients have access to a VC capable device with an internet connection or know a close friend or family member who could provide access to a VC capable device with an internet connection.

One VC consultant and one health care provider noted that technical issues with the VC platform set-up was another barrier that prevented the use of VC. To participate in a successful VC visit, patients must have an email address, use the correct web browser, have a working microphone and camera, and be able to navigate the VC platform. In addition, patients and providers need to be willing to participate in a VC visit. Two participants reported that the aging

population of health care providers may impact their willingness or technological ability to use video VC. One VC consultant reported that if either of these conditions was not met, the patient would have difficulty in conducting their VC visit and may default to another VC service such as a phone call.

One major issue identified by all three VC consultants was the lack of adequate bandwidth available in some rural areas to ensure a strong connection during a VC visit. Unfortunately, this issue requires excessive financial resources and support from the local internet provider. This barrier will not be impacted by any educational or orientation resources developed for patients from this project.

Educational Resources or Orientation Strategies

Throughout the interviews with the six participants involved, most felt that patient orientation was an area that needed further attention. Four out of six participants reported that patients were not properly orientated and would benefit from a resource to increase their knowledge on VC use prior to their first VC visit. One health care provider noted that when using VC via telephone there was no need for patient orientation but if VC via video was necessary patients would need more support. Health care providers felt their training was adequate and they were very comfortable to conduct video VC visits if needed. However, they felt that the orientation and support for patients was inadequate. This was supported by the remaining three participants as they felt that most resources for orientation to VC were geared toward the health care provider and very little focus was on the patient's learning needs prior to engaging in VC. Since VC orientation for patients was identified as being inadequate, health care providers and VC consultants were asked if they had any suggestions on information to be included in patient resources or orientation. One VC consultant and one health care provider felt

that patient orientation should address the issue of using the proper web browser and setting up a valid email account prior to a VC visit as both were needed for the visit to occur smoothly.

One VC consultant suggested that clerical staff who are responsible for booking appointments should be asking patients if they would prefer VC via telephone or video. Although most participants identified the need for a resource that addressed patient awareness and provided information for patient orientation, when asked during the interview they had few suggestions on how to incorporate this resource effectively for patients. One VC consultant suggested a commercial to promote awareness, while another consultant felt that a VC team should focus on patient awareness and/or orientation resources.

Effectiveness of Previously Used Resources

There were minimal interventions discussed that addressed the patient use of VC. All participants were asked if they were aware of any patient resources or orientation strategies that were implemented to patients prior to attending a VC visit. Two of the VC consultants discussed orientation strategies that were previously conducted in their region. One discussed prior patient orientation with informational pamphlets and posters that were distributed to patients on VC services. However, this initiative was conducted greater than five years ago when VC services from home was not available. At that time patients were appreciative of the information and the use of VC had increased which indicates that an updated resource is needed on the VC from home service. The second VC consultant discussed that information on the VC from home service was publicized in the community at the onset of the COVID-19 pandemic and patients were guided toward the Newfoundland and Labrador Centre for Health Information (NLCHI) website for further resources. Both resources were not formally evaluated and therefore the effectiveness is unknown and limited to the VC consultants' perception of effectiveness.

Other Strategies

In addition to the previously described interventions that were discussed by the VC consultants, some discussion occurred from three participants on the resources that NLCHI had updated for patients and health care providers. These resources featured detailed instructions for video VC visits prior to participating in a VC visit. Although it is important to have informational resources in place for patients, if patients are unable to access these resources or do not know they are available, then the information will not be effective.

There were also initiatives for patients who do not have access to a device to conduct VC visits. Three participants noted initiatives that supplied devices to patients in need as a way of minimizing this barrier to VC use. Patients who regularly use video VC visits and did not have an updated device that could conduct the visit were loaned a device from the regional health authority. The funding for purchasing devices was available through the regional health authority which originated from the federal government. Another VC consultant reported that some funding was obtained through the community raised hospital foundation money.

Additionally, some discussion occurred on aspects outside of patient orientation or awareness initiatives. Two participants discussed the need for updated policies on the use of VC in practice and the need for standardization of care across the province. One participant felt that if VC use was standardized that patients and providers would feel confident in using the service for receiving high quality care and would likely increase the use of VC. Both participants felt that if the regional health authorities had policies that supported the use of VC regularly in patient care, it would provide support and encouragement to providers to avail of the service more frequently. However, advocating for a policy change is beyond the scope of this practicum project.

Implications for the Practicum Project

After comparing and analyzing the data gathered through six consultation interviews for this project, it is evident that a patient resource is needed to promote awareness and understanding of the VC from home service. Information from the consultations has suggested that the current patient informational resources and orientation for VC services is inadequate. During the COVID-19 pandemic, patient orientation for VC services was not a priority in comparison to provider orientation as a focus was placed on ensuring providers felt comfortable using the VC platform technology. However, since the video aspect of VC use is low in the rural area of interest for this practicum project, current efforts should be placed on ensuring patients are comfortable in using VC services and raising awareness that VC services are available to them from their home.

Throughout the consultation interviews, the participants unanimously agreed that patient awareness and knowledge regarding VC use was limited and should be addressed with orientation. The topics that were suggested to include in a patient resource are summarized in Table 1.

Table 1

Summary of Topics and Processes

Topics	Processes
• Where VC visits can be conducted • Benefits of VC use in rural areas • Patient requirements for VC use • VC platform types • Navigating the VC platform • Contact information if no access to a VC capable device • Contact information for technical support prior to or during a VC visit	• How to set up an email address • Appropriate web browser use for each VC platform and device • Link to resources from NLCHI on VC set-up and troubleshooting • Use pamphlets and/or brochures

These consultations have been necessary to incorporate the experiences of the individuals who use VC daily or are responsible for implementing patient or provider resources. There were limitations in asking health care providers and VC consultants and not the patient population as these participants would provide their beliefs, while the personal experiences of patients would not be depicted. Patients could have shared their views on what information would be important to them and how they would prefer to access that information. However, if patient awareness is an issue there may also be a limitation in asking patients for their experiences with a service that they are not aware exists and had no prior orientation for. The patient would not be able to discuss the effectiveness of any learning strategy or orientation resource as none have been conducted in the rural area of interest for this practicum project.

The health care providers and VC consultants chosen held key information on the use of VC and the barriers they noted that prevented patients from availing of the service. With the information gained through these consultations in combination with evidence from the literature review, appropriate information can be provided to patients through an orientation resource. The method of resource delivery that appeared to have the highest effectiveness as perceived by a VC consultant, was the use of a pamphlet on VC services. Therefore, it is reasonable to consider repeating this method of delivery for patient orientation to the VC at home service. Since the evidence and effectiveness was reported by only one VC consultant and not formally evaluated, it is important to pilot test this resource to evaluate the effectiveness and modify the resource as necessary to meet the users' needs prior to distributing it to the entire patient population. It is anticipated that this resource will raise awareness of the availability of VC in rural areas and increase patients' comfort level with using VC technology.

Conclusion

From the findings discussed in this consultation report in combination with the evidence from the literature review, it is evident that a resource to support patient awareness and knowledge on the use of VC services from home is necessary. After analysis of the consultation findings, it is reasonable to consider implementing a patient resource in the form of a pamphlet or brochure that features the benefits of VC for rural residents, patient requirements prior to conducting VC (e.g., having a valid email address and adequate internet connection and/or device), navigating the VC platform to build patient confidence, and how to access the proper resources if needed for conducting VC visits.

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Appendix B1: Email of Inquiry for the Regional Telehealth Coordinators, Regional Telehealth Manager, Provincial Program Manager of Telehealth, and Telehealth Nurse Educator

Dear (insert name),

I am requesting your **participation in an interview regarding the use of virtual care in your region**. Your participation in this interview would be helpful for the completion of my practicum project that is required for my graduation from the Master of Nursing program at Memorial University. The goal of this practicum project is to develop a resource to promote awareness and understanding of virtual care for patients in rural areas with the goal of increasing the satisfaction and use of virtual care. To create a helpful resource, I am interested in **understanding more on the use of virtual care visits at home** and any resources or tools that were used in the orientation or implementation of this service for patients.

From my experience as a Registered Nurse working in a rural health environment, there are challenges in accessing health services for residents of rural communities. These challenges can potentially be minimized with the regular use of virtual care. However, the uptake of this service appears to be low, and the service is not clearly understood. With the development of this practicum project, I hope that rural residents will be more informed and educated on how to use virtual care at home to ease their ability to access health care services.

This practicum project requires consulting individuals in the process of understanding important information in relation to project development and I believe that you may have information to share on this topic that I would enjoy the opportunity to discuss with you. This interview can be conducted by phone and should take only 20 minutes of your time. Please understand that your participation is completely voluntary and the responses you provide will be kept confidential and accessed only by myself and my practicum supervisor. There will be no implications for your workplace whether you choose to participate or decline this invitation to interview. All information will be kept confidential, used for development purposes only, and discarded after the completion of this project.

If you are interested in participating or have any further questions, **please send an email to xxxxxx@mun.ca or call (xxx) xxx-xxxx before July 27, 2021 as I would like to complete all interviews prior to August 6, 2021**.

Thank you,

Christina Dominey, BNRN

Appendix B2: Email of Inquiry for Family Doctors and Nurse Practitioners (NPs)

Dear (insert name),

I am requesting your **participation in an interview regarding the use of virtual care in your workplace to meet with patients**. Your participation in this interview would be helpful for the completion of my practicum project that is required for my graduation from the Master of Nursing program at Memorial University. The goal of this practicum project is to develop a resource to promote awareness and understanding of virtual care for patients in rural areas with the goal of increasing the satisfaction and use of virtual care. To create a helpful resource, I am interested in **understanding more on the use of virtual care visits at home** and any resources or tools that were used in the orientation or implementation of this service for patients.

From my experience as a Registered Nurse working in a rural health environment, there are challenges in accessing health services for residents of rural communities. These challenges can potentially be minimized with the regular use of virtual care. However, the uptake of this service appears to be low, and the service is not clearly understood. With the development of this practicum project, I hope that rural residents will be more informed and educated on how to use virtual care at home to ease their ability to access health care services.

This practicum project requires consulting individuals in the process of understanding important information in relation to project development and I believe that you may have information to share on this topic that I would enjoy the opportunity to discuss with you. This interview can be conducted by phone or in person and should take only 15 to 20 minutes of your time. Please understand that your participation is completely voluntary and the responses you provide will be kept confidential and accessed only by myself and my practicum supervisor. There will be no implications for your workplace whether you choose to participate or decline this invitation to interview. All information will be kept confidential, used for development purposes only, and discarded after the completion of this project.

If you are interested in participating or have any further questions, **please send an email to xxxxxx@mun.ca or call (xxx) xxx-xxxx before July 27, 2021 as I would like to complete all interviews prior to August 6, 2021**.

Thank you,

Christina Dominey, BNRN

Appendix B3: Semi-Structured Interview Guide for the Regional Telehealth Coordinators, Regional Telehealth Manager, and Provincial Program Manager of Telehealth

1. How long have you had this position as a regional telehealth coordinator?
2. Are virtual care visits from home a frequently used service in your region?
    a. What type of VC visits are being conducted? (e.g., audio only via phone, or audio/video via Webex or Zoom)
    b. What issues are you hoping to have patients use VC for? (e.g., chronic conditions like diabetes or for initial assessment of acute symptoms)
3. With the onset of the COVID-19 pandemic, VC use has been frequently encouraged. Has there been any initiatives for patients or health care providers to increase their use of VC during the pandemic?
    a. If so, who is responsible for implementing these interventions?
    b. What type of initiatives have been implemented?
    c. Has the effectiveness of these interventions been evaluated? (e.g., has increased patient satisfaction been reported or has there been an increased use of VC).
    d. The literature has indicated that patients have concerns around privacy and confidentiality when using VC. Can you please describe how the VC program at your organization addresses this?
4. There has been evidence in the literature to suggest that rural areas have not increased their use of VC as quickly as those in urban areas, despite the promotion of VC during the pandemic. Have you noticed any differences in the incidence of VC use between rural and urban settings in your role?
    a. If so, can you please describe this?

5. The literature suggested that financial concerns and a lack of an adequate internet connection were barriers that impacted the use of VC. Have these concerns been noted in your region?
    a. If so, have any initiatives been implemented to overcome this barrier?
    b. Is there funding available to provide VC-capable devices and/or an adequate internet connection to individuals who do not have access to these resources? If yes, can you please describe this? (E.g., Who is eligible? What is the application process?)
6. Technology concerns was another frequently reported barrier in the literature. Some participants refused to use VC due to their anxiety or lack of comfort with technology. However, the literature demonstrated that technical support by email or phone prior to and during a VC visit were interventions to overcome this barrier. Were there any resources used for patient orientation prior to their first virtual care visit?
    a. What type of resources were they?
    b. Do you feel the resources/initiatives were effective?
    c. Did patients report they were satisfied with the support and/or the VC service?
    d. Did you notice an increase in virtual care use after these initiatives were implemented?
    e. What other resources would you recommend to assist staff and physicians to increase the usage of virtual care?
7. The literature indicates that patients have reported that they have not used VC because they did not know the service was available to them in their area. Were any interventions implemented to increase patient awareness or promote the use of virtual care in your

region?

   a. If so, what type of interventions or resources were they?
   b. Who was responsible for implementing these interventions and/or resources?
   c. Have you noticed an increase in VC use or patient reported satisfaction after these interventions?

8. The literature notes that patients have also reported that their healthcare providers have not been discussing VC with them as an option that is available for their use. Have you seen this issue in your role?
   a. If so, can you please describe how this has been addressed?
9. Have you experienced any barriers with staff, physicians, or patients that we have not discussed? If so, can you please describe this?
10. Do you have any other suggestions on how to increase the use of the virtual care at home service in rural areas?
11. Do you have any additional comments on the virtual care at home service that you would like to share?

Appendix B4: Semi-Structured Interview for Family Doctors and NPs

1. How long have you been practicing in a rural health care setting?
2. When did you first hear about VC and that it was an available resource for you to meet with patients?
3. Have you used the virtual care at home service to conduct visits with patients remotely?
    a. If so, were you satisfied with the quality and outcome of the VC platform?
    b. Which platform did you use? (Webex, Zoom, phone call)
    c. How comfortable are you with using VC if a patient requests this service?
    d. The literature has indicated that patients have concerns around privacy and confidentiality when using VC. Can you please describe how this addressed in your area?
    e. What issues are you hoping to address using VC? (e.g., chronic conditions like diabetes or for initial assessment of acute symptoms)
4. Evidence from the literature has suggested that providing formal training to healthcare providers resulted in increased use of VC in one study. Were you given any training on VC prior to using the service?
    a. What type of training did you receive?
    b. Did you feel this type of training was effective for you?
    c. What other type of support, if any, would you benefit from for increasing your comfort level with VC?
5. The literature suggested that financial concerns and a lack of an adequate internet connection were barriers that impacted the use of VC. Have these concerns been noted in your area?

    a. If so, have any initiatives been implemented to overcome this barrier?
    b. Is there funding available to provide VC-capable devices and/or an adequate internet connection to individuals who do not have access to these resources? If yes, can you please describe this? (E.g., Who is eligible? What is the application process?)

6. Technology concerns was another frequently reported barrier in the literature. Some research participants refused to use VC due to their anxiety or lack of comfort with technology. However, the literature demonstrated that technical support by email or phone prior to and during a VC visit were interventions to overcome this barrier. Were there any resources used for patient orientation prior to their first VC visit?
    a. What type of resources were they?
    b. Do you feel the resources/initiatives were effective?
    c. Did patients report they were satisfied with the support and/or the VC service?
    d. Did you notice an increase in VC use after these initiatives were implemented?
    e. What other resources would you recommend to assist staff and physicians to increase their usage of VC?
7. The literature has noted that some patients have reported that their healthcare providers have not discussed the option of using VC with them. Have you offered your patients the option of using VC?
    a. When offered, are patients accepting or resistant to the service?
8. The literature indicates that patients have reported that they have not used VC because they did not know the service was available to the in their area. Were any interventions implemented to increase patient awareness or promote the use of VC in your area?

    a. If so, what type of interventions or resources were they?
    b. Who was responsible for implementing these interventions and/or resources?
    c. Have you noticed an increase in VC or patient reported satisfaction after these interventions?
9. Have you experienced any barriers in your practice with VC that we have not discussed?
10. Do you have any suggestions for increasing the use of virtual care for your area?
11. Do you have any additional comments on the use of virtual care that you would like to share?

Appendix B5: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Christina Dominey

Title of Practicum Project: The Development of a Resource to Support the Utilization of Virtual Care at Home in Rural Communities.

Date Checklist Completed: July 30, 2021

This project is exempt from HREA approval because it matches item number three from the list below. These consultations seek to gain access to information on the initiation of VC services and the effectiveness of learning resources for patients prior to utilizing VC. The information gained will be used solely for the purpose of improving the VC at home service for patients in rural communities.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no

research question involved (used exclusively for assessment, management or improvement purposes).

4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/

Appendix C

VC Awareness Patient Resource Pamphlet to Raise Awareness and Promote Understanding of VC

Christina M. Dominey

Memorial University of Newfoundland

Microsoft Word Stock Image

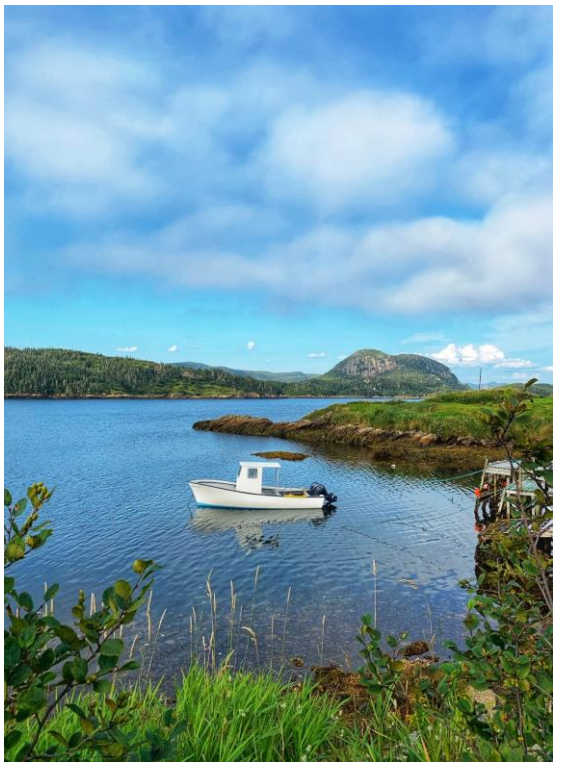
Virtual care has been used by patients for many years in health care. With the current need for physical distancing in the COVID-19 pandemic, virtual care options are used and encouraged more often.

Quick Fact

Virtual care is an easy way to connect face-to-face with your health care provider without leaving your home. Its use is increasing across the country and has many benefits for those in rural communities including **cost saving** and **easier access** to health care services!

If you have further **questions** about the virtual care services in your area, **please contact**:

Calder Health Care Center Receptionist
(709) 886-3350 Ext: 4110



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VIRTUAL CARE IN RURAL HEALTH

Resource Created By:
Christina Dominey, BNRN

Microsoft Word Stock Image

Virtual care is interacting with your health care provider from your own home using technology such as a smartphone or computer that has a camera.

Is virtual care available in my area?

Yes! Virtual care is available to anyone who has a smartphone, tablet, or computer with a camera and internet connection. Virtual care appointments can take place from your home and connect you to a health care provider in their office.

Residents of rural communities can have equal access to high quality health care services without leaving their home!

Virtual care has additional benefits for patients in rural communities:

- Reduced need for travel which results in cost and time savings.
- Increased access to health care providers.
- Decreased need for unnecessary patient transfers out of their community.

Microsoft Word Stock Image

Virtual Care *Uses*

- Non urgent medical concerns (long term disease, mental health concerns, etc.)
- Follow up appointments
- Prescription refills

Conditions *Not Suitable* for Virtual Care

- Chest pain
- Shortness of breath
- Injury resulting from an accident

Where can Virtual Care be used?

- In a quiet, private place of a patient's home.
- The home must have an internet connection and a device with a camera.

Appendix D

Technical Support Patient Resource Pamphlet to Increase Patient Comfort Levels with the Technology Required for Using VC

Christina M. Dominey

Memorial University of Newfoundland

TIPS

- Ask your health care provider for a test call to ensure you are comfortable with the virtual care system.
- Keep your device updated regularly (you can select 'automatic updates' under settings for most devices).
- Keep contact numbers close in case you have problems during your video virtual care appointments.
- To protect your privacy, always attend your appointment in a quiet, private place where you can discuss your concerns.

Microsoft Word Stock Image

Contact Us

Always keep this contact information close during your virtual care appointment.

Calder Health Care Center
Receptionist
(709) 886-3350 Ext: 4110
Ramea Clinic
(709) 625-2115

There are telehealth coordinators in each region across the province that can assist you as well. Feel free to send them an email.

Western
telehealth@westernhealth.nl.ca

Central
telehealth@centralhealth.nl.ca

Eastern
telehealth@easternhealth.ca

Labrador
telehealth@lghealth.nl.ca

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VIRTUAL CARE GUIDE: TECHNICAL SUPPORT FOR USING VIRTUAL CARE AT HOME

Resource Created By:
Christina Dominey, BNRN

Before Your Appointment

You will need:

- A smartphone, tablet, or computer with a camera.
- Ensure your device is fully charged.
- A working internet connection.
- A valid email address.

TEST YOUR DEVICE

The Newfoundland and Labrador Centre for Health Information (NLCHI, 2020) recommends that you conduct a test of the internet connection on the device that you will use to complete the virtual care appointment. This test can be found under step #3 at https://virtualcarenl.ca/im-a-patient/getting-set-up

Used with permission from J. Baggs

During Your Appointment

To connect to your appointment:

1. Open your email and locate the email sent about your appointment.
2. Click the link found in the email.
3. Follow the instructions on the screen.
4. If asked, always 'enable' (or allow) microphone and/or camera use for this appointment.

Being familiar and comfortable with the virtual care system before attending your appointment will increase the chance that your appointment will go smoothly.

If you have any ***questions*** about if video virtual care appointments are appropriate for your health care needs, ***talk to*** your health care provider.

HELPFUL RESOURCES

NLCHI (2020) has many resources that can help patients become familiar with virtual care before their appointment. Type these websites in your internet search bar and have a look!
https://virtualcarenl.ca/im-a-patient/support-and-faqs/

https://virtualcarenl.ca/im-a-patient/resources/

Microsoft Word Stock Image

CHOOSING YOUR PROGRAM

If you have an:

- **Apple smartphone**, use the **Safari browser**.
- **Android smartphone**, use the **Chrome browser**.
- **Computer**, use the **Chrome browser** or **Microsoft Edge**.

*Do **not** use Internet Explorer for virtual care appointments.