

EDUCATING PROVIDERS AND MEDICAL ASSISTANTS ON A SKIN  
ASSESSMENT FORM FOR TELEDERMATOLOGY CONSULTS

by

Awungcha Sandra Nkemzi

---

Copyright © Awungcha Sandra Nkemzi 2020

A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

THE UNIVERSITY OF ARIZONA

2020

THE UNIVERSITY OF ARIZONA  
GRADUATE COLLEGE

As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Awungcha Sandra Nkemzi, titled Educating Providers and Medical Assistants on a Skin Assessment Form for Tele dermatology Consults and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

*Mary Davis, PhD, RN, CPHQ* Date: Apr 13, 2020  
Mary P. Davis, PhD, RN, CPHQ

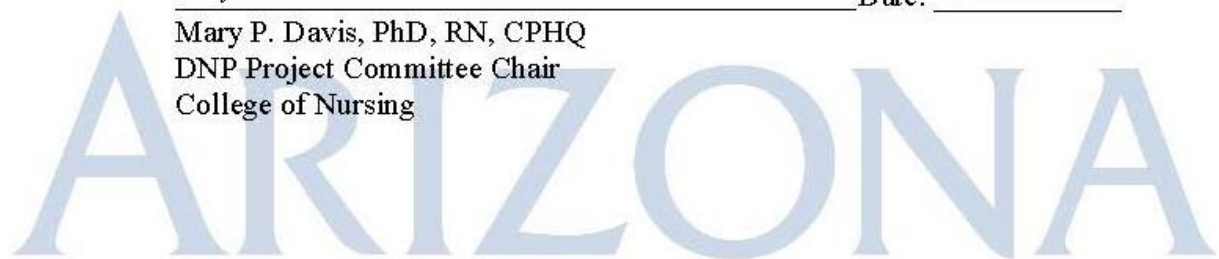
*Michelle Kahn-John* Date: Apr 14, 2020  
Michelle Kahn-John, PhD, RN, PMHNP-BC, GNP

*Kimberly D. Shea* Date: Apr 14, 2020  
Kimberly D. Shea, PhD, RN, CHPN

Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

*Mary Davis, PhD, RN, CPHQ* Date: Apr 13, 2020  
Mary P. Davis, PhD, RN, CPHQ  
DNP Project Committee Chair  
College of Nursing



## ACKNOWLEDGMENTS

Successfully completing this project was the most challenging aspect of my Doctoral program. I will like to acknowledge my project committee members Dr. Mary Davis, Dr. Kim Shea and Dr. Michelle Khan-John for their constant encouragement, support and bring out potential in me I never thought I had. I will particularly like to thank Dr. Mary Davis for her constant availability, acknowledging my hard work every step of the way and constant support, which gave me the courage to continue and overcome my fears.

My project completion could not have been achieved without the support of the staff at Mariposa Community Health Center. I will like to thank Dr. Eladio Pereira for allowing me to review their teledermatology charts and suggesting ideas for improvement and his assistant Julia for facilitating paperwork completion and scheduling the in-service. Special thanks to Dr. Henry who was the most instrumental person behind the project. Dr. Henry welcome my idea and ensured that the in-service education was successfully completed.

Words alone cannot express how grateful I am to my family and friends for their constant support and prayers and especially for taking good care of my kids when I was busy with schoolwork. Thanks to my kids for making this journey worthwhile. To my dad Francis Alatefor and my mom Fortaboh Esther, thank you for laying my educational foundation, for the sacrifices you made to provide my needs from elementary to high school and for being there for me every day unconditionally. Special thanks to my husband Dr. Gaetan Nkemzi, who has been my greatest cheerleader in my career. I appreciate all the encouragement, financial and moral support, and the late nights you stayed up to review my papers. With you by my side, I am the luckiest woman on earth.

To crown it, I will like to thank the Lord Almighty for the strength and gifts of the Holy Spirit that helped me become who I am today. May God bless all those I mentioned above. Nothing is impossible with God by your side.

## DEDICATION

This project is dedicated to all the new telehealth programs especially in rural areas.  
Thank you all for increasing patient access to general and specialty health providers.

## TABLE OF CONTENTS

LIST OF FIGURES .....	7
LIST OF TABLES .....	8
ABSTRACT .....	9
<b>INTRODUCTION</b> .....	<b>11</b>
<b>Local Problem</b> .....	<b>12</b>
<b>Intended Improvement</b> .....	<b>15</b>
<b>Project Question</b> .....	<b>17</b>
<b>Specific Aim</b> .....	<b>17</b>
<b>Theoretical Framework</b> .....	<b>17</b>
<b>Unfreezing</b> .....	<b>18</b>
<b>Moving or Transitioning</b> .....	<b>18</b>
<b>Refreezing</b> .....	<b>19</b>
<b>Synthesis of Evidence</b> .....	<b>20</b>
<b>METHOD</b> .....	<b>22</b>
<b>Purpose</b> .....	<b>22</b>
<b>Participants</b> .....	<b>22</b>
<b>Setting</b> .....	<b>23</b>
<b>Project Design</b> .....	<b>24</b>
<b>Logic Model</b> .....	<b>24</b>
<b>Data Collection</b> .....	<b>28</b>
<b>Data Analysis</b> .....	<b>29</b>
<b>Ethical Consideration</b> .....	<b>30</b>
<b>Beneficence</b> .....	<b>30</b>
<b>Respect for Persons</b> .....	<b>31</b>
<b>Justice</b> .....	<b>32</b>
<b>RESULTS</b> .....	<b>32</b>
<b>Demographics</b> .....	<b>32</b>
<b>Pre-Survey Responses</b> .....	<b>33</b>

TABLE OF CONTENTS – *Continued*

<b>Post-Survey Responses</b> .....	34
<b>DISCUSSION</b> .....	40
<b>Limitations</b> .....	41
<b>Future Implications</b> .....	42
<b>Conclusion</b> .....	43
<b>OTHER INFORMATION</b> .....	43
<b>Resources</b> .....	43
APPENDIX A: TELEDERMATOLOGY WORKFLOW CHART.....	44
APPENDIX B: DISCLOSURE FORM.....	46
APPENDIX C: INSERVICE AGENDA AND PRESENTATION .....	48
APPENDIX D: SKIN ASSESSMENT FORM .....	52
APPENDIX E: PRE-SURVEY .....	55
APPENDIX F: POST-SURVEY .....	57
APPENDIX G: SYNTHESIS OF EVIDENCE.....	60
APPENDIX H: SITE APPROVAL LETTER .....	67
APPENDIX I: THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD APPROVAL LETTER.....	69
REFERENCES .....	71

## LIST OF FIGURES

<i>FIGURE 1.</i>	Logic model on skin assessment form for teledermatology. ....	25
<i>FIGURE 2.</i>	Percentage of correct responses on the pre-survey and post-survey.....	36
<i>FIGURE 3.</i>	Responses about the skin assessment form.....	39
<i>FIGURE 4.</i>	Responses to usefulness of presentation. ....	39

## LIST OF TABLES

TABLE 1.	<i>Participant demographics</i> .....	33
TABLE 2.	<i>Frequency of in-service responses on the skin assessment form per participant's profession</i> .....	37

## ABSTRACT

**Purpose:** The purpose of this quality improvement project was to present a skin assessment form that could be used for documentation during teledermatology consult at Mariposa Community Health Center (MCHC).

**Background:** Dermatologic conditions are a major disease burden in the United States and worldwide. About 85 million Americans sought care for skin conditions in 2013. With the increasing number of skin conditions and shortage of dermatologist, patients have limited access to dermatologist. Teledermatology is a branch of telehealth currently being used to bridge the dermatologist gap in most areas especially rural areas. There is limited information on efficient documentation form for providers. As a result, documentation of a skin condition for teledermatology varies based on provider discretion. A skin assessment form (SAF) could make documentation easy, straight forward and consistent among providers.

**Method:** The logic model was used to implement the project. Thirty health care staff at MCHC were invited to participate in the project. Participants were invited through email. A pre-survey assessing participant knowledge about teledermatology program guidelines at MCHC was completed. Health providers and medical assistants participated in a one-day in-service on a skin assessment form that can be used for teledermatology documentation. After the in-service education, participants completed a post survey.

**Results:** Eighteen invitees attended the in-service. Six participants (33.3%) completed the pre-survey and post-survey. Responses from the participants indicated the skin assessment form was well received and they were agreeable to using the form in practice. Other benefits of the form are it is simple, easy to use, straightforward and contains relevant dermatology information.

**Conclusion:** The education on the use of the skin assessment form was well received as evidenced by the agreement of the health center participants to pilot the form. Similar program evaluation or quality improvement projects has great potential to enhance teledermatology programs thereby improving efficiency and patient outcomes.

## INTRODUCTION

Telehealth and telemedicine are terms often used interchangeably (Tuckson, Edmunds, & Hodgkins, 2017), and can be defined as providing health care at a distance through electronic communication to improve patient's health (Dorsey & Topol, 2016; HealthIt.gov, 2017; Tuckson et al., 2017). The focus of this paper is to evaluate the application of telehealth in increasing access to dermatologists for patients at a rural health clinic and to provide both program evaluation support and quality improvement recommendations.

During the last two decades in the United States (US), there has been a consistent shortage of dermatologists (Feng, Berk-Krauss, Feng, & Stein, 2018). In addition, Feng, Berk-Krauss, Feng and Stein (2018) showed that, while the number of dermatologists in the US increased by 21% from 1995 to 2013, the density gap of dermatologists in urban versus rural areas increased from 3.41 to 4.03. Patients in rural areas sometimes have to travel long distances and wait for long periods to see a dermatologist (Feng et al., 2018). Studies on health care access have consistently found that there is less likelihood a patient would travel more than 20 miles to receive care even if the care is provided free of charge (Myers, Helming, Mutrux, Fleming, & Edison, 2018). As the United States population and life expectancy continue to increase, there is a greater need for dermatology care in both urban and rural areas (Feng et al., 2018).

Dermatologic conditions are a major disease burden worldwide (Lim et al., 2017). In 2013, approximately 85 million Americans sought care for skin diseases. Affected persons had an average of 1.6 skin diseases and the prevalence doubled in adults 65 years and older (Lim et al., 2017). Half of the 24 skin disease categories assessed in 2013 had associated deaths, more than 60% of which were because of skin cancer (Lim et al., 2017). Skin cancer is the most

common form of cancer worldwide. About 99% of skin cancers are curable if diagnosed and treated early (Skin Care Foundation, 2019). Skin cancer screening involves performing a total body skin examination in high-risk patients (National Cancer Institute, 2019). During the total body skin exam, the dermatologist looks for moles or areas with abnormal shape, size, color or texture. If abnormal skin areas are detected, a biopsy is ordered (National Cancer Institute, 2019). In rural areas, most of these skin conditions are being exclusively managed by primary care providers because of a lack of access to a dermatologist. Dermatologist density therefore affect disease outcomes especially with melanomas and carcinomas (Feng et al., 2018).

Telehealth is a rapidly growing field in medicine and is being used to increase patient access to primary care providers and specialist such as dermatologist (Dorsey & Topol, 2016). Telehealth reduces family and patient travel burdens, provides access to service, facilitates prescription refill, facilitates appointment scheduling, increases convenience and reduces cost (Tuckson et al., 2017; Dorsey & Topol, 2016). Telehealth is provided through live video (synchronous), store and forward (asynchronous), remote patient monitoring and mobile health (U.S. Department of Health and Human Services [USDHHS], 2016). Many organizations provide affordable virtual visits (less than \$50 per visit) 24 hours a day for irritating, common and inconvenient conditions (Dorsey & Topol, 2016). In the United States, 76% of hospitals currently use telemedicine to provide care to patients at a distance (American Hospital Association, 2019).

### **Local Problem**

Arizona residents are at high risk for skin conditions. Skin cancer is especially common because Arizona is close to the equator, close to the sun and has a warm climate year-round

(Arizona Skin Cancer Institute [ASCI], 2019). Arizona low latitude and high-altitude leads to decreased skin protection from the sun's ultraviolet rays. Arizona residents also tend to spend more time outside because of warm weather conditions. The only registry available for reporting skin conditions in the United States is the cancer registry. This makes it challenging to estimate the number of skin disease cases in Arizona. There are different types of skin cancer, but only cases of melanoma are required (by the cancer registry) to be reported (ASCI, 2019). The incidence of invasive melanoma increased from 18.2 cases in 2009 to 21.6 cases in 2014 per 100,000 persons in Arizona (Arizona Department of Health Services [ADHS], 2017). Early diagnosis and treatment could increase patient rate of survival from skin cancer. With the shortage of dermatologist in rural areas, telehealth can increase patient access to dermatologist in Arizona.

Because of dermatologist shortage of rural areas, the site for this project contracted with Community eConsult Network (CeCN) to provide teledermatology services to their patients in a rural city in Arizona. The services began in January 2019 using the store and forward (asynchronous) telehealth method. Store-and-forward is easy, convenient, has a rapid turnaround time, prevents unnecessary patient travel, shortens wait times, and increases provider-to-provider communication (Vimalananda et al., 2015). The workflow diagram for a teledermatology consult at the site is displayed in Appendix A. The consult begins with the referring provider creating the referral in the electronic health record with the specific questions. The referring provider then sends the referral to the referral coordinator and notifies the medical assistant. The medical assistant takes at least three pictures of the skin condition using a Logitech camera and uploads the pictures into the patient's electronic chart. The referral coordinator (RC) reviews the referral

to determine if it is appropriate. If the referral is not appropriate, the RC follows organizational guidelines. If the referral is appropriate, the RC sends the referral with provider's note (includes a description of the skin condition, treatment provided, outcome and list of current medications) and pictures (sent through Crimson) to a virtual location for CeCN. The RC for the CeCN submits the consult to a specialist. The specialist (dermatologist) reviews the pictures and provider's note and responds to the clinical question within two business days. The RC for the CeCN sends the specialist response to the site through fax. Medical records staff receive the fax and then scans it into the patients' chart. The PCP reviews the response and takes appropriate action.

Teledermatology program at the site was evaluated six months after implementation to determine if program guidelines were being met. According to CeCN guidelines, all consults should contain specific clinical problems or consult question, patient demographics, most recent progress notes, current medication list, recent laboratory results, relevant diagnostic results and other specialist referrals. Additional information required for dermatology submission are at least three photos of the skin condition and any results of dermatologic biopsies. Consults results should be received in two days.

The site completed 26 teledermatology consults from January 2019 to June 2019. Internal Review Board approval was obtained through the University of Arizona for a chart review (Appendix I). All 26 charts were reviewed. The results of the chart review showed that all consults had a specific question, patient demographics, progress notes, medication list and at 2 to 10 pictures. Some 38% of consults were sent out on the same day and about 54% of consults could not be sent on the same day because the RC was waiting for providers notes to be

completed. Totally, some 71% responses were received within two days, 25% of responses were received after two days and no response received for 4% of the consults. Providers took an average of 2.72 days to review the response and sign off on it. Some 85% of the patient's skin conditions were treated through teledermatology. In addition, 77% of patients had documentation showing or suggesting that they were notified of the dermatologist recommendation. Moreover, 19% of patients had no clear documentation suggesting they were notified of dermatologist recommendation. Patients were notified of dermatologist recommendations through phone calls, postal mail and in person.

Based on chart review findings, stakeholders at the site were interested in finding ways to ease provider documentation so consults can be sent out on the same day. Teledermatology is a new field with very little evidence about documentation templates or checklists.

### **Intended Improvement**

The purpose of this DNP project is to present a skin assessment form (Appendix D) to be used as a checklist during a teledermatology consult. The goal is to encourage stakeholders to implement the skin assessment form as the main documentation form for teledermatology consults. Checklists gained attention after the Institute of Medicine (IOM) published an article on medical errors. A checklist could act as a reminder, a simple list of things required, items to be considered or done to ensure that steps are not omitted (Grif Alspach, 2017). Some benefits of checklist are ease of use, straight forwardness, saving effort and time, specifying and summarizing information, minimizing unintended interpretation, preventing omission and ensuring consistency among providers. As stated in the literature, checklists have been used to decrease central-line associated bloodstream infections and the rate of surgical deaths and post-

surgical complications. Checklist implementation also improved care provided to trauma patients and improved adherence to prehospital care for chronic obstructive pulmonary disease and asthma patients (Grif Alspach, 2017).

Checklists have been shown to be beneficial in many healthcare settings but there are no studies about the use of a checklist in teledermatology. A few articles found in the literature address the use of standardized templates for teledermatology consultation to decrease the rate of face-to-face referrals. Developing a form from available templates could ensure documentation consistency among providers, prevent omission and save time and effort.

The skin assessment form was developed from teledermatology documentation template from the South West Telehealth Resource Center (SWTRC) and a teledermatology practice guide from the California Telemedicine and eHealth Center (CTEC). According to the SWTRC, a general dermatology documentation template should include demographics, clinical history, reason for consultation, duration and location of problem, skin and systemic symptoms, previous therapy and known allergies. On the other hand, the skin evaluation form from CTEC contains questions on demography, drug allergies, duration of skin problem, skin symptoms, previous skin and oral medications used, family history of skin cancer and a skin diagram to indicate location of the problem. Most of the required documentation information from CTEC and SWTRC are similar. Similar and unique questions from both sources were included in the development of the skin assessment form. In place of a skin diagram, a question about location of skin problem is included.

### **Project Question**

Will education on the skin assessment form increase provider and medical assistant willingness to use the skin assessment form to document teledermatology consults at the Mariposa Community Health Center?

### **Specific Aim**

The specific aim of this DNP project is to educate providers and medical assistants on the use a skin assessment form during teledermatology patient encounters in place of provider notes. The goal is to educate 80% of primary care providers and medical assistants who are currently using or intend to use teledermatology services at the community health center on the skin assessment for within a week. Education will be provided during an in-service education session.

Aim 1: Present results of chart audit showing that 54% of teledermatology referrals were not sent out on the same day because provider documentation was not completed.

Aim 2: Educate providers and medical assistants who are currently using or intend to use teledermatology services on the skin assessment form.

Aim 3: Conduct a survey before and after the in-service education session and provide a summary of survey results to the clinic administrators.

### **Theoretical Framework**

The theoretical framework that will guide this project is Lewin's theory of planned change. Lewin was a 20th century social psychologist (Tiffany & Lutjens, 1997) who worked as a refugee scholar at Cornell University. After the Second World War, he established the research center for Group Dynamics at the Massachusetts Institute of Technology (Burnes, 2004). Lewin believed that identifying or determining the strength of driving and restraining

forces would make it possible to understand individual actions, group actions and forces that need to be adjusted for change to occur (Burnes, 2004). Lewin developed his theory by experimentation, which was the new field psychology method at that time. The stages of Lewin's theory of planned change are unfreezing, moving or transitioning and refreezing (Tiffany & Lutjens, 1997).

### **Unfreezing**

*Unfreezing* is the first stage of change. According to Lewin, equilibrium has to be destabilized (unfrozen) in order for old behaviors to be discarded and new behavior adopted (Burnes, 2004). For example, a change agent recognizes a problem, identifies what needs to be change and mobilizes others to see the need for change (Shirley, 2013). A solution is selected, and arrangements made on how to institute the solution. Successful change requires weakening restraining forces and strengthening driving forces (Shirley, 2013). Restraining forces make change challenging such as lack of training, fear and lack of incentives. Driving forces prevent aversion to change. Examples of driving forces are increased efficiency; stakeholder demands and executive mandate.

### **Moving or Transitioning**

*Moving or transforming* is the second stage of Lewin's theory. In this stage, change is viewed as a process and not an event (Shirley, 2013). A detailed plan of action is developed, and people are engaged in the process. This stage is challenging because of fear and uncertainty that comes with change. Identifying or predicting an outcome is difficult because of the complexity of forces involved (Burnes, 2004). Education is provided to overcome fear and encourage clear communication to prevent losing focus on the desired goal (Shirley, 2013).

## **Refreezing**

*Refreezing* is the third stage of the theory of planned action (Shirley, 2013). It requires stabilizing change, so it becomes part of the existing system. This stage emphasizes the driving forces that facilitate change and overcome forces that could affect change. Refreezing change creates a new equilibrium, which is the new performance expectation or new norm. This stage is important because institutionalizing or locking in change is vital for sustainability (Shirley, 2013).

Lewin's theory of planned action is appropriate for this project because it describes the stages through which change happens. It also emphasizes that driving and restraining forces to change need to be identified and addressed in order for change to occur successfully. The stages of Lewin's theory of planned action that will be applicable to this project are unfreezing and moving. In the unfreezing stage, a chart review was conducted, and different problems identified. From these problems, how long providers take to complete progress notes after a teledermatology consult was selected as the focus of this project. Some 54% of referrals were not sent out on the same day because provider notes were not completed. The solution proposed is a short and precise skin assessment form that can be completed during the visit and sent to the referral coordinator on the same day. In the moving stage, providers and medical assistants will be educated on how to utilize this form. A questionnaire will be completed before and after the education session (Appendix E & F).

Refreezing is beyond the scope of this project because of limited time available to carry out the project. After using the form for six months, providers will decide if they prefer the form and it could become part of the existing system.

## Synthesis of Evidence

A literature search was conducted to find studies that were related to checklist for teledermatology. PubMed and CINAHL Plus with full text were searched using the search terms “teledermatology,” “skin assessment checklist for teledermatology” and “standardized templates for teledermatology.” The search term “skin assessment checklist for teledermatology” or “skin assessment form for teledermatology” yielded zero results in both PubMed and CINAHL Plus. Using the search term standardized templates for teledermatology yielded two results in PubMed and one results in CINAHL Plus. All articles on standardized templates are included on the synthesis of evidence table in Appendix G.

Using the PubMed search tool, the term “teledermatology” yielded 724 articles. One filter added was articles within five years and the search resulted in 307 articles. Including many filters provided very few articles on the subject; therefore, only one filter was used. Articles were excluded on a quick glance based on number of pages. Articles were also eliminated based on title, language and availability of full text. Four articles related to store-and forward teledermatology were selected.

In the US, about one-third of the population is affected by dermatologic conditions every year (Naka, Lu, Porto, Villagra, Wu, & Anderson, 2018). Despite the high incidence of skin conditions, there is a shortage of dermatologists especially in rural areas. Store-and-forward teledermatology is a promising service that could increase access to dermatology services (Naka et al., 2018; Cumsky et al. 2019). Store-and-forward (SAF) teledermatology occurs when a primary care provider takes pictures of a patient’s skin condition, include documentation of skin problem and send to a dermatologist for review. The dermatologist reviews the skin condition

and information provided and send treatment recommendations back to the primary care provider (Naka et al., 2018; Yang, Barbieri, & Kovarik, 2019). Studies have shown that 84 to 86% of dermatologic conditions can be managed using SAF teledermatology and prevent face-to-face dermatology visit (Naka et al., 2018; Yang et al., 2019). Teledermatology could also decrease no-show rates, which are common for specialty appointments. This could save both the patient and specialist time. Studies have shown that teledermatology is cost effective and providers are satisfied with the process (Naka et al., 2018; Yang et al., 2019).

There are multiple gaps in the literature on quality improvement studies and checklists for teledermatology. No information could be found in the literature on a skin assessment form or form for teledermatology. Three articles addressed the use of standardized templates for teledermatology documentation. Two of the articles showed that the use of standardized templates could decrease face-to-face dermatology evaluation (Cumsky et al., 2019; Maly et al., 2019). More studies are needed in this area of teledermatology.

The use of large-scale participants is the only strength of the studies. The studies have a few weaknesses. The first weakness of the studies is poor generalizability because the studies were carried out either in specific settings or with specific populations. Second, only one study was randomized which implies that participant selection could have been bias. Another limitation is that teledermatology services were provided to patient on specific insurance plans meaning providers might be overusing teledermatology for patients whose insurance covers the services (Naka et al., 2018; Yang et al., 2019).

## **METHOD**

### **Purpose**

The purpose of this DNP project was to present a skin assessment form to be used as a checklist during teledermatology consult. One aim of the project was to educate providers and medical assistants who are currently using or intend to use teledermatology services on how to use a skin assessment form. This skin assessment form can be used during teledermatology patient encounters to document skin conditions in place of provider notes. The skin assessment form is a one-page form, which is simple and straightforward. It will enable the provider to complete documentation for teledermatology referral during the patient visit, which can then be sent to the referral coordinator on the same day. First, the participants were presented the result of a chart review, which showed that 54% of teledermatology consults were not sent out on the same day because provider notes were not completed. Second, a pre-survey was completed which asked about participants demographic information and participant knowledge of the teledermatology procedure and expectation. Third, the participants were educated on the skin assessment form. The in-service presentation can be found in Appendix C. Lastly, a post-survey was completed after the education session to assess the participant knowledge of teledermatology procedure and expectation. The post-survey assessed participant knowledge on the skin assessment form and the willingness of the participants to use the form. An appointment was made to present results to the facility.

### **Participants**

The following inclusion criteria were used: a) primary care providers who were already using teledermatology services, b) medical assistants who assisted providers during

teledermatology consult, c) English-speaking, and d) other providers, medical assistants and health care personnel who intended to use teledermatology. Exclusion criteria were: a) non-English-speaking providers and medical assistants and b) individuals with no health-care training. Some 30 participants were invited through email.

### **Setting**

The project was conducted at the Mariposa Community Health Center (MCHC) in Nogales, Arizona. A site approval letter was obtained and can be found in Appendix H. Mariposa Community Health Center is a federally qualified health center (Health Resource and Service Administration, n.d.). It was created in 1980 to meet the health needs of people living in Santa Cruz County. At that time, uninsured and low-income patients received affordable public health services and primary care services from a nurse practitioner and a pediatrician. In 1985, the health center became a private, nonprofit corporation that contracted with the county health department to provide all public health services (Mariposa Community Health Center, n.d.). Nogales is a rural area and border city between the United States and Mexico with a surface area of 20.82 square miles (United States Census Bureau, n.d.). Nogales has about 20,188 inhabitants of which 94.6% are Hispanic or Latino, 3.2% Caucasians and 2.2% of other ethnicities (United States Census Bureau, n.d.). About 11.9% of the population are uninsured and 33.9% of households live in poverty (United States Census Bureau, n.d.). Nogales is a medically underserved area with a shortage of healthcare providers (Health Resource and Service Administration, n.d.). With only one dermatologist in the city, Mariposa Community Health Center started providing teledermatology service at no cost to their patients in January 2019. Patients will be charged for teledermatology services in the future.

## **Project Design**

### **Logic Model**

The project design for this project was the logic model (Figure 1). Logic models are used for communicating, describing, planning and evaluating an intervention or a program (Centers for Disease Control and Prevention [CDC], n.d.). It shows the relationship between program activities and the desired effects. Logic models need to be periodically revised to include lessons learned, new evidence and changes in activities, expectation or context (CDC, n.d.). Utilizing logic models raises the likelihood of program success because it outlines the purpose and expected program results, describes the desired actions used as a reference point for all participants and improves staff expertise in program implementation and evaluation. The logic model also involves stakeholders, incorporates research findings and identifies potential program barriers so they can be addressed early on (CDC, n.d.) The components of a logic model are visually engaging, presented on one page, audience specific, appropriate detail, easy to relate, clarifies program activities and reflects program context. In this project, a logic model was developed for entire program evaluation. Developing a logic model consist of six steps (CDC, n.d.).

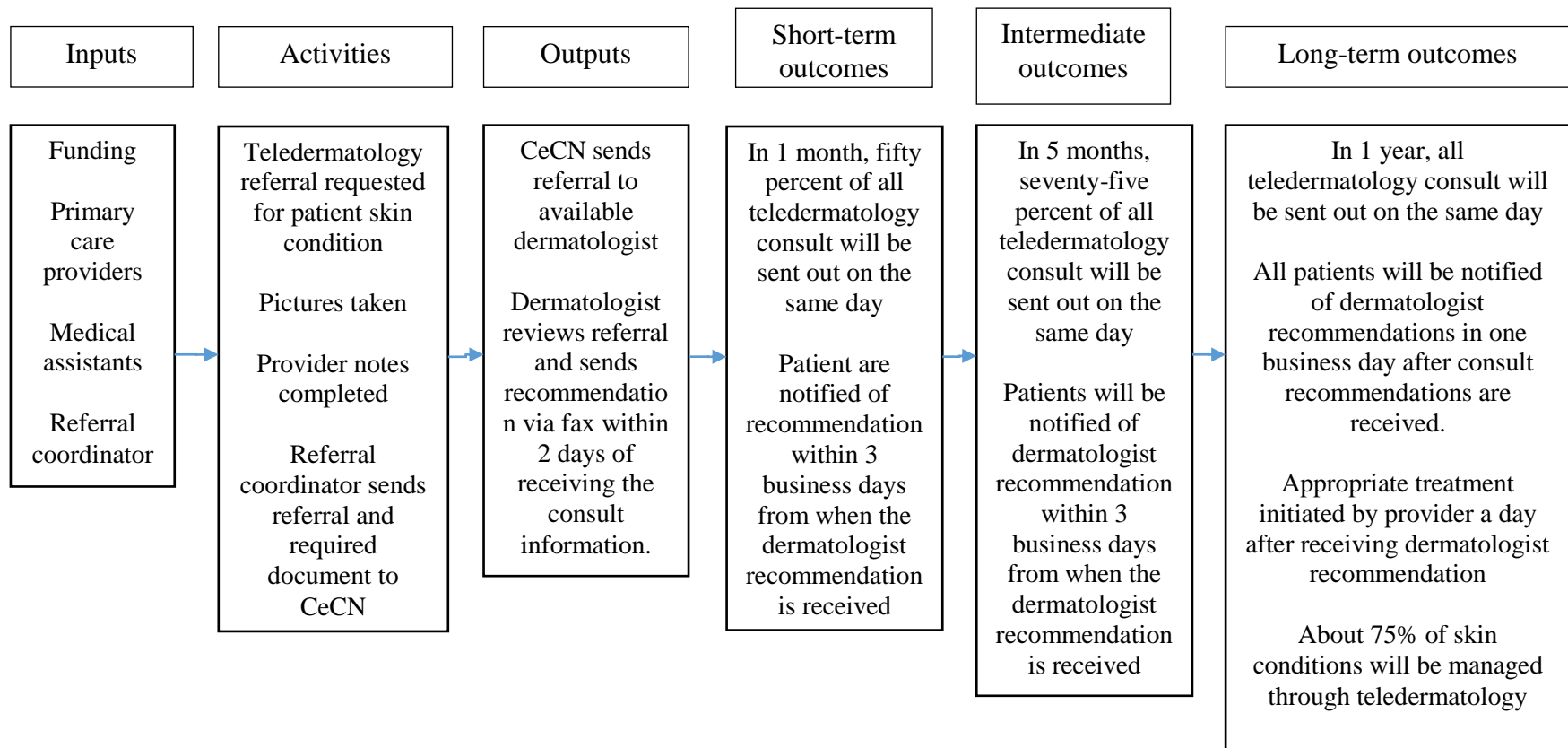


FIGURE 1. Logic model on skin assessment form for teledermatology.

The first step was determining the purpose of the program, identifying potential users and reason for using the program (CDC, n.d.).

The purpose of the teledermatology program was to provide dermatology services to patients with skin conditions that needed a specialist opinion via teledermatology. This program was used to bridge the gap of dermatologist shortage in rural areas. Program users include patients, medical assistants and primary care providers.

The second step was to convene stakeholders and determine participants. Participants could be managers, program planners, epidemiologist or any individuals or groups that contribute to the program outcome (CDC, n.d.).

Providers and medical assistants participate were the key stakeholders in this DNP project because they collect required information and necessary documentation for teledermatology consults.

The third step was determining the focus of the program. This step was to determine if the program was used for a single or multiple intervention and the required amount of detail to make the tool useful (CDC, n.d.). The teledermatology program was often used for single intervention.

For this project, a chart review was completed which revealed that skin conditions were found on either one or multiple sites on the patient's body. Pictures of each skin condition location were included before the referral was sent to the dermatologist.

The fourth step was understanding the situation. The program goals or objectives were used as an anchor to establish priorities and clarify expectations (CDC, n.d.). The goal of the

teledermatology program was to obtain a dermatologist opinion of a skin condition within two days.

For this project, 26 charts were reviewed to evaluate the program. Results of the chart review showed that 54% of teledermatology referrals were not sent out on the same day because provider documentation were not completed. Because of the delay, dermatologist recommendation was not received two days from the consult. This result led to the creation of a one-page skin assessment form that could be used for documentation during a teledermatology consult.

The fifth step of the logic model was exploring research, finding out what other places have done and are doing. This step was done before the intervention was carried out.

The literature search for this project showed that teledermatology was convenient, easy, had a quick turnaround time and shortened wait time (Vimalananda et al., 2015).

Teledermatology also increased access to dermatologic care and decreased the time to initiate appropriate treatment. Teledermatology recommendations have an 89.7% diagnostic concordance with the dermatology clinic (Carter et al., 2017).

The sixth step includes the logic model and was formatted as a series of activities and outcomes using a left-to-right approach. Activities are connected to outcomes using arrows. The left-to-right approach consist of input, activities, output and outcome. The input for the program was the funding provided by the Mariposa Community Health Center (MCHC) and services provided by the primary care providers, medical assistants and referral coordinator. Program activities were taking appropriate pictures, completing required documentation and sending referrals for dermatology consult. The referral coordinator sends the referral, pictures and

provider documentation to Community E-Consult Network (CeCN). For output, CeCN receives the referral and sends it to any available dermatologist. A dermatologist reviews the information and sends treatment recommendation through fax within two days. These recommendations are scanned into the patient's folder by medical record staff. The intended short-term outcomes were fifty percent of all teledermatology consult will be sent out on the same day in one month and patients will be notified of recommendation within three business days from when the dermatologist recommendation is received. Intermediate outcomes were; 75% of all teledermatology consults will be sent out on the same day in five months and patients will be notified of dermatologist recommendation within three business days. Long term outcomes were: a) sending all teledermatology consults out on the same day in a year's time, b) patients will be notified of consult results within one business day, c) primary care provider will initiate dermatologist suggested treatment in one business day, and d) 75% of skin conditions will be managed through teledermatology.

### **Data Collection**

The initial data collection plan was for participants to complete in-person paper surveys at the site. However, due to the coronavirus disease (COVID-19) pandemic in March 2020, gatherings were discouraged so the in-service was changed from in-person presentation to an online platform.

The in-service was presented through zoom software and surveys were emailed to participants before the online in-service. One staff at MCHC emailed the pre-survey and post-survey to all participants. Participants printed or download surveys before completing them.

Completed surveys were emailed to the staff at MCHC, which was forwarded to student via email.

A pre-survey and post-survey were used for data collection. The pre-survey (Appendix E) containing eight questions was completed at the start of the in-service and was expected to be completed in two minutes. Demographic information collected included job title and years of professional and teledermatology experience. The pre-survey also included questions about participant knowledge of the teledermatology procedure and expectation.

The post-survey (Appendix F) was completed following the education. Demographic data were reported again. The post-survey had 19 questions, eight of which are the same as in the pre-survey. Eight questions addressed the benefits and willingness to use the skin assessment form. Questions about benefits of the form were graded on a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree.' One question asked about the usefulness of the presentation and another question asked providers if the skin assessment form would decrease documentation time. The last questions on the post-survey asked about suggestions for future education and changes that could be made to the skin assessment form.

### **Data Analysis**

The data collected from the pre- and post-survey was analyzed using descriptive statistics. Descriptive statistics is used to describe data in a project or study (Mirsha, Pandey, Singh, Gupta, Sahu, & Keshri, 2019). They provide simple data summaries that can be easily understood by the audience or reader. Graphs, bars and tables were used to display pre-survey and post-survey responses. Information about job title, years of professional experience, and length of teledermatology experience are displayed in a table. Tables accurately present

information that cannot be presented on a graph. Survey results on the usefulness of the education were displayed on bar graphs. Questions assessed using the 5-point Likert provided ordinal data that were displayed in Table 2 and bar graphs. Written suggestions were summarized and added in the post-survey results. In addition, all the data collected was presented tables, pie chart, column charts and discrepancies were explained. Utilizing colored graphs, bar chart and tables improved data visualization. This helps the reader to be engaged in the data presentation and easily identify areas of interest and possible trends (In & Lee, 2017).

### **Ethical Consideration**

The main purpose of this project was to educate providers on a skin assessment form for teledermatology consult. The Belmont report was published in 1979, outlined the cruel acts against humans for research purposes, and summarized ethical principles that must be addressed in all projects involving human subjects from there henceforth (Miracle, 2016). Ethical principles applicable to this project were beneficence, respect for persons and justice.

#### **Beneficence**

Beneficence means doing good. It works in collaboration with the principle of non-maleficence, which emphasizes on doing no harm (Melia, 2014). People are addressed and treated with respect. Strategies are put in place to ensure security. The two main principles of beneficence include; do no harm and minimize potential harm and maximize benefits (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979; Miracle, 2016). Based on these principles, project investigators are required to make inquiries and be aware of the potential risk and harm that could result from a study. Project investigators should be able to decide when benefits outweigh risk or when risk outweigh benefit

and the research foregone. Researchers are obliged to take the necessary precautions to avoid harm to any participant irrespective of beneficial outcomes (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Participants must also be aware of potential adverse effects before agreeing to participate in any projects.

Specific to this project, there were no known risks or potential harm to participants. There was a potential long-term benefit to patients if the skin assessment form was implemented at the community health center, ensuring all patients receive consult results within two days. A disclosure form was provided to participants. The student was Health Insurance Portability and Accountability Act (HIPAA) certified and understood the importance of confidentiality and consequences of bridging confidentiality. No information collected for the purpose of this study contained any patient identifiers. The completed surveys were given to the University of Arizona after the project was presented.

### **Respect for Persons**

Respect for persons means individuals have the right to make decisions for themselves and their decisions should be respected (Melia, 2014). Individual judgement and choices are accepted unless it could be detrimental to the individual and/or others (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Lack of respect is denying freedom or deliberately withholding information needed to make decisions (USDHHS, 1979). Respect means allowing participants to voluntarily participate in a project.

In this project, participation was voluntary. Providers and medical assistant utilizing teledermatology services and volunteers were encouraged to voluntarily attend the in-service education. A disclosure form was be provided to all participants (Appendix B). The decisions of

medical assistants and providers who decided not to attend the in-service education session were respected and maintained the same relationship with colleagues. Participants also had the right to withdraw at any time during the in-service education session and survey completion. And 12 people withdrew after completing the in-service.

### **Justice**

Justice means treating people fairly (Melia, 2014). Injustice is when entitled benefits are denied or undue burdens are imposed without appropriate reason. The purpose of the in-service education was presented to the participants. The student did not deliberately withhold any information from participants. Medical assistants and providers were selected for the in-service because they collect information that is sent to the dermatologist but were all treated in the same way. The student thanked participants for sacrificing their time to attend the in-service education session.

This project was submitted to the University of Arizona Internal Review Board (IRB) for review. Project was implemented after IRB approval was received stating that the project was not research (Appendix I).

## **RESULTS**

### **Demographics**

Thirty health professionals at Mariposa Community Health Center (MCHC) met the inclusion criteria and were invited through email by a staff at MCHC to attend the in-service via zoom. The pre- and post-surveys were attached to an email also sent to all participants. Some 18 health professionals attended the in-service session and six participants completed both the pre- and post-surveys for a response rate of 33.3%. The respondents included two medical doctors

(33.3%) and four medical assistants (66.6%). Three respondents had 1-5 years of professional experience (N=3, 50%), one had 6-10 years of professional experience (N=1, 16.7%) and two had more than 10 years of professional experience (N=2, 33.3%). All participants had less than a year of experience with teledermatology (N=6, 100%). Demographic information for respondents from the pre-survey and post survey is displayed on Table 1.

TABLE 1. *Participant demographics.*

<b>Pre-Survey Participants (N=6)</b>			<b>Post-Survey Participants (N=6)</b>		
<i>Job Title</i>			<i>Job Title</i>		
Medical Doctor	Medical Assistant		Medical Doctor	Medical Assistant	
33.3% (N=2)	66.6% (N=4)		33.3% (N=2)	66.6% (N=4)	
<i>Years of professional experience</i>			<i>Years of professional experience</i>		
1-5 years 50% (N=3)	6-10 years 16.7% (N=1)	10 years 33.3% (N=2)	1-5 years 50% (N=3)	6-10 years 16.7% (N=1)	10 years 33.3% (N=2)
<i>Years of experience with teledermatology</i>			<i>Years of experience with teledermatology</i>		
< 1 year 100%			< 1 year 100%		

### **Pre-Survey Responses**

In the pre-survey, participants were asked to answer questions assessing their knowledge of the teledermatology program by picking one answer among the answer choices provided. Questions 4 to 8 on the surveys were: (4) Number of skin pictures to be taken for a teledermatology consult? (5) What should be done after taking skin pictures? (6) When should teledermatology documentation be completed after consult? (7) When should the referral coordinator send out a teledermatology referral? And (8) When do you expect to get a response from the dermatologist? Pre-survey responses are displayed on Figure 2. On question (4), all

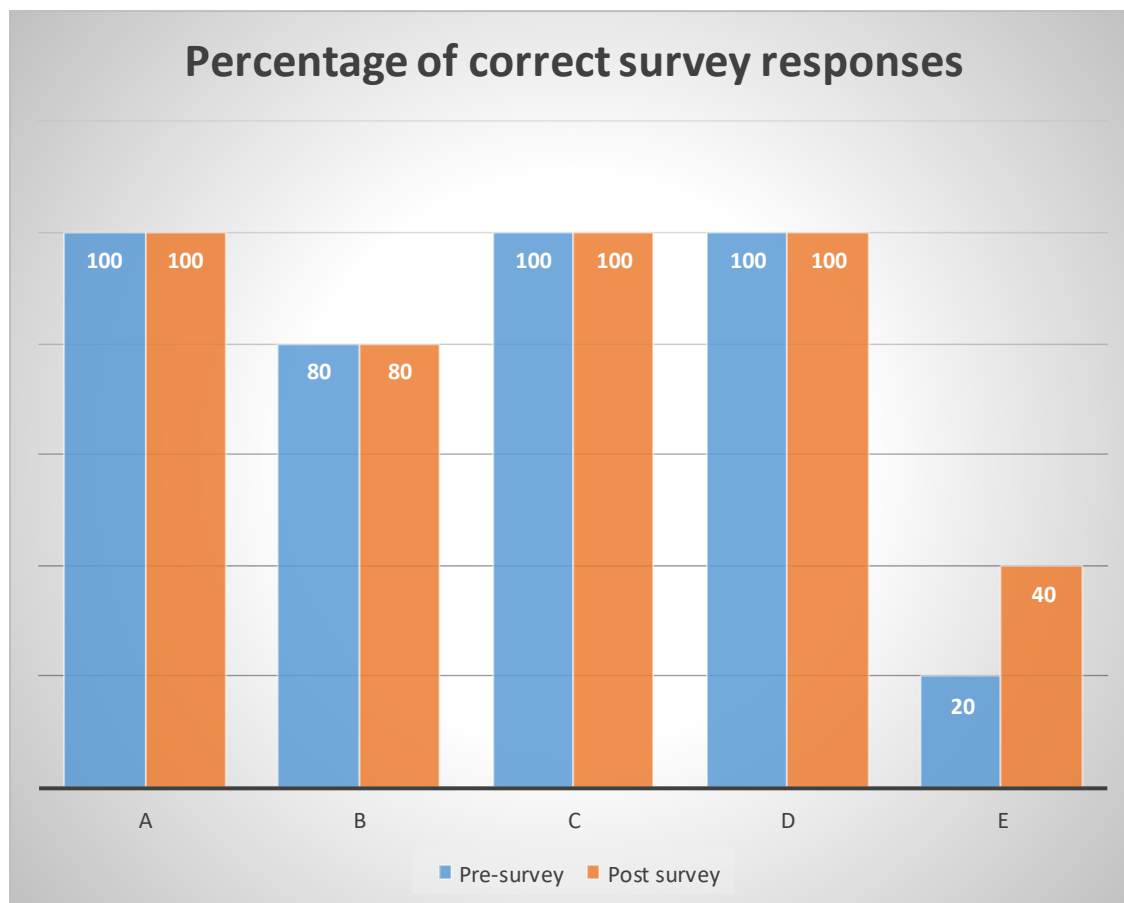
respondents selected three to five pictures (N=6, 100%). On question (5), five respondents selected the option that pictures taken should be reviewed with the referring provider (N=5, 83.3%) and one respondent selected the option that the pictures should be reviewed with the medical assistant (N=1, 16.7%). On question (6), all respondents selected the option that teledermatology documentation should be completed on the same day (N=6, 100%). On question (7), all respondents selected the option that the referral coordinator should send out the teledermatology referral on the same day (N=6, 100%). On question 8, five respondents selected the options that the dermatologist response should be received in three to five days (N=5, 83.3%) and one respondent selected the option that the response should be received within two days (N=1, 16.7%).

### **Post-Survey Responses**

The five knowledge questions on the post-survey were the same questions asked on the pre-survey. Four out of the five questions had the same answers on the post-survey as on the pre-survey. On question 8, one respondent changed their response about the expected time for dermatologist response from three to five days to within two days (N=2, 33.3%) and four respondents selected the options that the dermatologist response should be received in three to five days (N=4, 66.7%) (Figure 2).

The next eight questions on the post-survey were about rating the skin assessment form based on a 5-point Linkert scale. Linkert scale response options were: ‘strongly disagree,’ ‘disagree,’ ‘neither,’ ‘agree’ and ‘strongly agree.’ Last of all, one question was about the usefulness of the presentation and the final question asked for suggestions to improve the form.

Responses to questions using the Likert scale are displayed on Table 2. Five respondents selected 'strongly agree' (N=5, 83.3%) and one respondent selected 'agree' (N=1, 16.7%) that the skin assessment (SAF) form was simple, straight forward, easy to use, will prevent omission, ensure consistency and will save time and effort. Four respondents selected 'strongly agree' (N=4, 66.7%) and two respondents selected 'agree' (N=2, 33.3%) that the skin assessment form captures the necessary information needed by the dermatologist. All respondents 'strongly agreed' that the skin assessment form can be completed during a patient visit and they are willing to use the form. Four respondents selected 'strongly agree' (N=4, 66.7%), one selected 'agree' and one selected 'neither' when asked if the skin assessment form will decrease provider documentation time. Five of the respondents thought the education was useful (N=5, 83.3%). The only suggestion was that a slot should be included on the form for pertinent past medical history. Student's response was that the site could make changes to the form if they wish.



*FIGURE 2.* Percentage of correct responses on the pre-survey and post-survey.

TABLE 2. Frequency of in-service responses on the skin assessment form per participant's profession.

<b>SAF is simple and straight forward</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD				1	1
MAs					4
<i>Total</i>				1	5
<b>SAF captures necessary information needed by dermatologist</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD				2	
MAs					4
<i>Total</i>				2	4
<b>SAF will save time and effort</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD				1	1
MAs					4
<i>Total</i>				1	5
<b>SAF will prevent omission</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD				1	1
MAs					4
<i>Total</i>				1	5
<b>SAF will ensure consistency</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD				1	1
MAs					4
<i>Total</i>				1	5
<b>SAF is easy to use</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD				1	1
MAs					4
<i>Total</i>				1	5

TABLE 2 – *Continued*

<b>SAF can be completed during patient visit</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD					2
MAs					4
<i>Total</i>					6
<b>I will be willing to use the SAF for teledermatology</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD					2
MAs					4
<i>Total</i>					6
<b>This form will decrease provider documentation time</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither</b>	<b>Agree</b>	<b>Strongly Agree</b>
MD			1	1	
MAs					4
<i>Total</i>			1	1	4

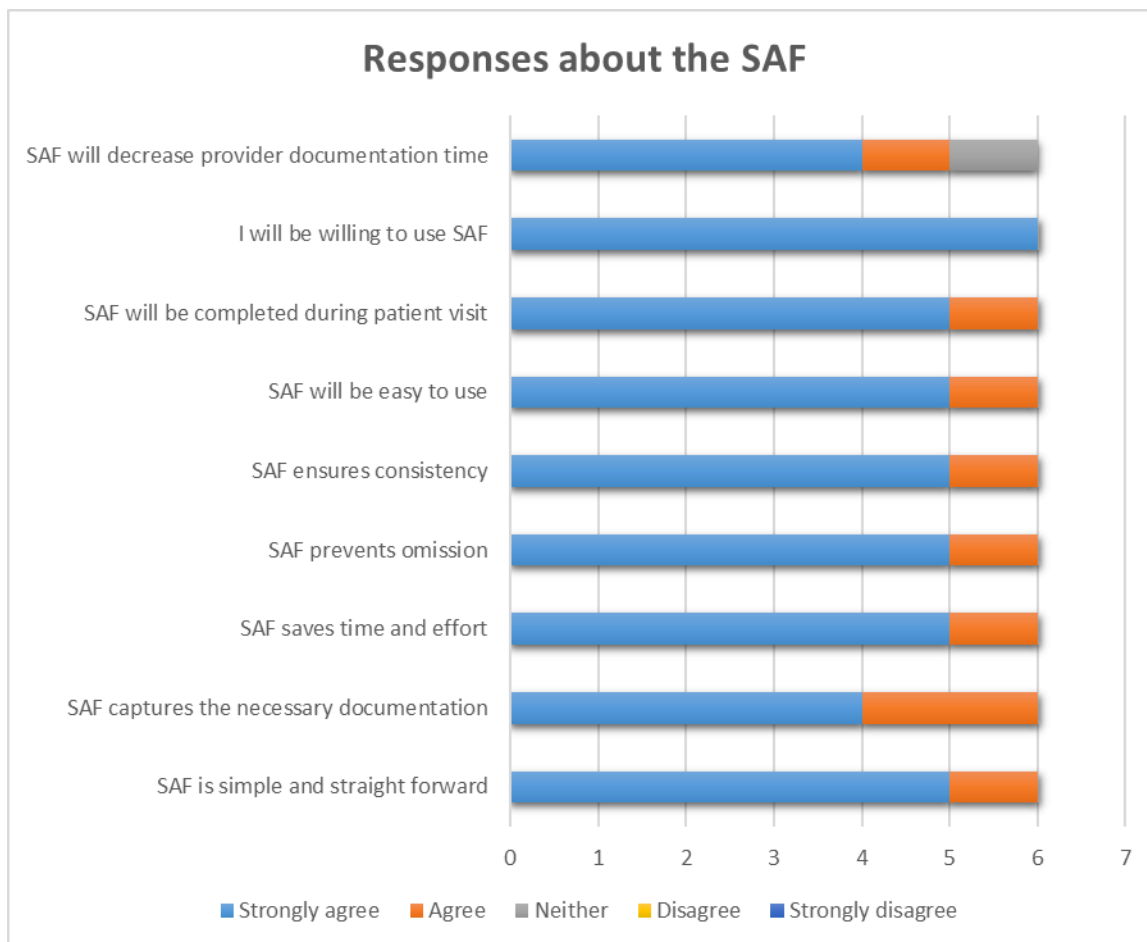


FIGURE 3. Responses about the skin assessment form.

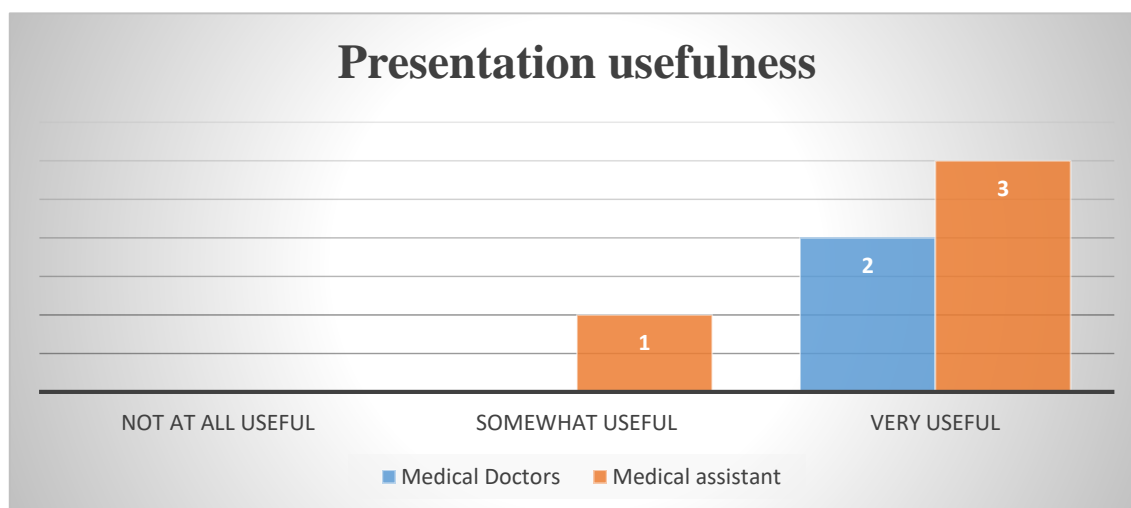


FIGURE 4. Responses to usefulness of presentation.

## DISCUSSION

The purpose of this project was to educate medical providers and medical assistants at the Mariposa Community Health Center (MCHC) on a skin assessment form that could be used to document a teledermatology encounter. The theoretical framework used to develop the project was the Lewin's theory of planned change as it outlines the various stages of change. This project educated 18 health professionals at MCHC on a skin assessment form that could be used for teledermatology documentation. The logic model was an efficient method used to guide the project implementation. The logic model made it possible to identify the input, activities and outputs needed to achieve short-term, intermediate term and long-term goals. Determining the goals of the project made it possible to implement the in-service education and have the surveys completed.

Education on the skin assessment was successfully completed. The general perception was that the form was simple, easy, and straightforward, contains the necessary information, will save time and effort, prevent omission and ensures consistency. All respondents were willing to use the form. Results of the in-service will be shared with MCHC through email. The skin assessment form will be revised for MCHC to include suggestion made during in-service.

Most respondents selected an incorrect response when asked about the expected time to get a response from the dermatologist. The dermatologist is expected to send a response for a teledermatology consult within two days and this information was included in the in-service education. Only one participant changed their answer after the in-service education. During the in-service there was noise detected in some participants' background (via the Zoom webinar platform) which might have been a distraction. Participants could also have been answering the

question based what the actual ongoing practices were at the local clinic. The DNP student project director will recommend that MCHC offer more clarification and education to their staff about the expected time for dermatologist response based on teledermatology program goals.

When the site was notified about the form, they were excited to have it presented to the staff and to get feedback from the participants. One of the medical doctors who uses teledermatology at the site was the main person supporting the project. Her support to this project could have been because a chart review had been completed at the site by this investigator and results presented to the site. Another reason why the site was interested in the project could have been since the teledermatology program was created, they have had no standardized documentation format for providers or medical assistants to use. The information that providers sent during consults was based on personal discretion. Having a form for documentation will promote documentation consistency among providers. In addition, new providers will be able to provide the same service to their patients with minimal supervision.

After presenting the skin assessment form, MCHC indicated that they would like to pilot the form for teledermatology documentation with the goal that most providers will complete documentation on the same day. The major barrier to implementing this form is that there is no software or already existing electronic version of the form. The site will have to decide if they want to use the paper version of the form and scan it into patient charts, which could be time consuming or add an electronic version to their already existing electronic health record.

### **Limitations**

The first and most significant limitation to this project was that only 6 out of 18 participants completed the pre- and post-survey. About 33.3% of participants responded to the

pre-survey and post-survey. Potential contributing factors to this low response rate could have been because participants had to print or download the surveys, complete and then send the surveys through email. In addition, participants attended the in-service during their break time and might not have had enough time to complete the surveys. The second limitation to this project was the method of delivery. The initial plan was to deliver the in-service in-person, but the format of the in-service was changed to a web-based Zoom presentation because of the COVID-19 pandemic in March 2020, and social distancing recommendations in order to decrease the spread of the virus. Participants were notified of the change a day before the in-service. If the in-service, pre-survey and post-survey were done in-person, there might have been a higher rate of attendance and participant responses. The third limitation to this project was the number of medical providers who completed the pre- and post-survey. Nine providers attended the in-service but only two completed the surveys. The medical assistants completed most of the surveys. Due to the low rate of survey responses, the results might not be a good representation of the thoughts of the MCHC health providers. Based on the sample size of this project, the results should be interpreted with caution.

### **Future Implications**

Mariposa Community Health Center (MCHC) agreed to pilot the skin assessment form for teledermatology documentation before the survey result were analyzed. Survey responses showed that respondents were willing to utilize and implement the form at the local site. After the coronavirus (COVID-19) pandemic is over and people are back to work, MCHC will decide on how to implement the form and start using it for teledermatology documentation. The site will determine when to evaluate the effectiveness of the form in the future.

## **Conclusion**

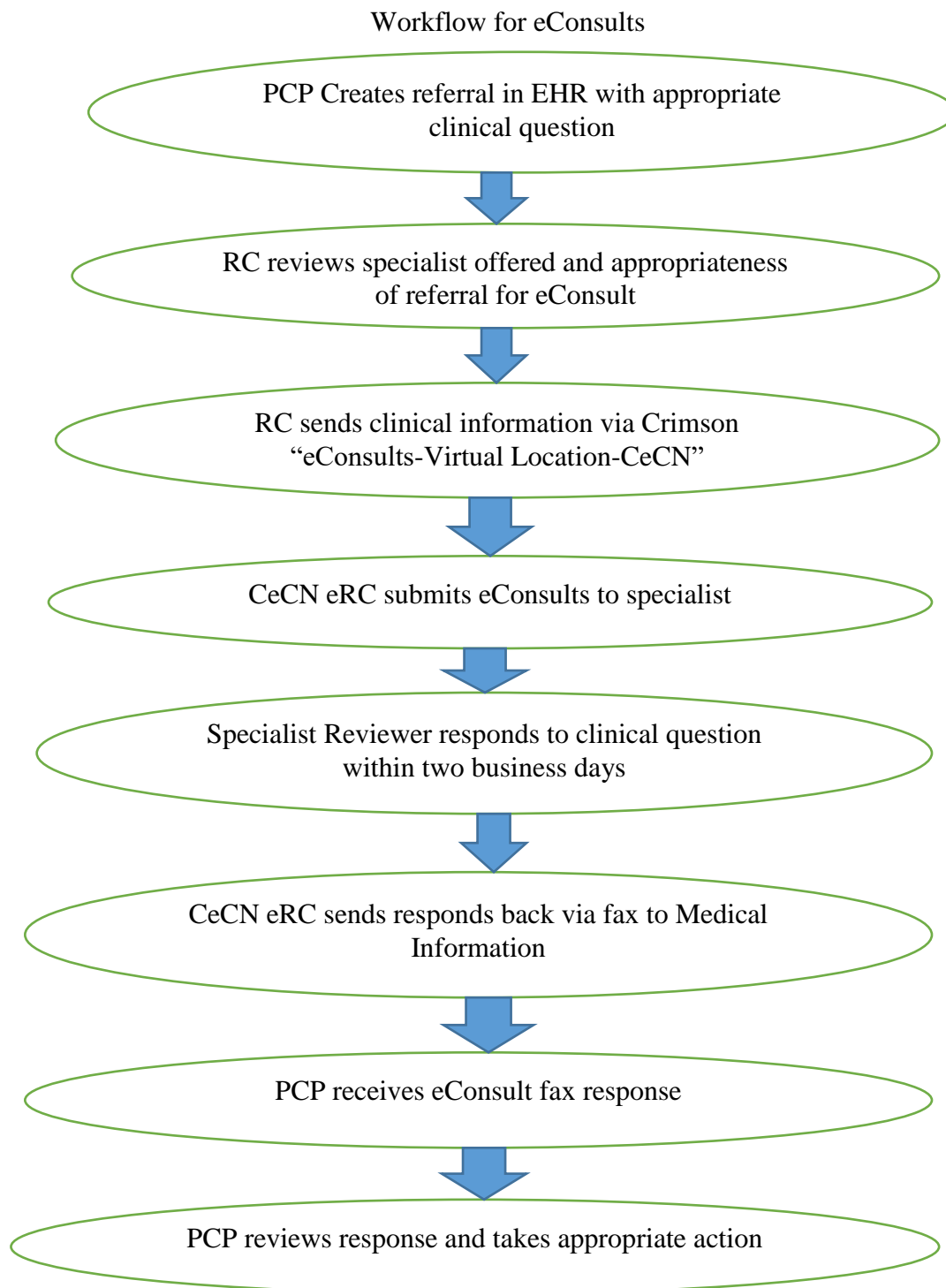
The purpose of this project was to educate health professional at MCHC on a skin assessment form for teledermatology documentation. The results of the education showed that participants are willing to use the form for documentation. Those who attended the in-service thought the form was straight forward, easy to use, saves time and can be completed during a teledermatology encounter. This form could improve teledermatology documentation. MCHC is willing to pilot the form at the site for teledermatology documentation.

## **OTHER INFORMATION**

### **Resources**

Resources needed were internet access and Zoom software, which was provided by the University of Arizona. Materials such as paper, ink and pens purchased were not utilized because the method of delivery was changed from in-person to online.

APPENDIX A:  
TELEDERMATOLOGY WORKFLOW CHART



APPENDIX B:  
DISCLOSURE FORM

## **Educating Providers and Medical assistants on skin assessment form for teledermatology**

**Awungcha S. Nkemzi**

The purpose of this project is to educate providers and medical assistants at Mariposa Community Health Center on a skin assessment form that could be used during teledermatology consult.

If you choose to take part in this project, you will be asked to attend an in-service education complete a pre and post survey. It will take approximately 2 minutes to complete the pre survey and 3 minutes to complete the post survey. There are no foreseeable risks associated with participating in this project and you will receive no immediate benefit from your participation. Survey responses are anonymous.

If you choose to participate in the project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may call Awungcha Nkemzi, DNP student at 520-302-1654

APPENDIX C:  
INSERVICE AGENDA AND PRESENTATION

### In-service Agenda

1. Pre-survey
2. Presentation of chart review findings and conclusions
3. Presentation of skin assessment form with justification
4. Question and answer
5. Post-Survey

### In-service Presentation

Welcome to this in-service education session. My name is Awungcha Nkemzi and I am a final year DNP student at the University of Arizona. Before I start the in-service education, I will like all participants to review the disclosure form, which states that individual participation is voluntary and then complete a short pre survey. I came to Mariposa Community Health Center in June 2019 to observe teledermatology as part of a telehealth certificate program that was started at the University of Arizona College of Nursing. I did a chart review on all teledermatology consults that had been completed from January to June 2019. The teledermatology program start with the provider placing an order for a teledermatology referral. The medical assistant takes 3-5 pictures of the skin condition from different angles, medical assistant and provider review pictures taken before its uploaded in-patient's electronic chart. Provider documents the onset, duration, aggravating factors and previous therapy tried. The referral coordinator sends the referral to CeCN with the pictures and provider documentation. I presented my findings to Dr Pereira and some staff in July. Overall, about 85% of skin consults were managed through teledermatology. This means patients did not have to travel or wait about 3 months to get a dermatology appointment. One of my findings during the chart review was that about 54% of

dermatology consults were not sent out on the same day because provider documentation was not completed. I also noticed that there was no standard way for providers to document during patient encounter for teledermatology consult and the amount of information needed. I searched the literature and found a skin assessment form being used by a teledermatology program in California. I incorporated some information from the program in California and information from the South West Telehealth resource center to come up with documentation form that I will be presenting to you.

This skin assessment form is a one-page document that can be completed during a teledermatology consult. The form has eleven items. The first item is patient's name. The second item ask for date of birth, age and sex. The third item is patient's drug allergies. Fourth item is the location of the skin problem. Fifth item is the type of skin problem and possible options are rash, lesion or mole. A space is provided under the fifth item to write in the skin problem if it is not included in the options. Sixth item asks how the skin problem bothers the patient. Possible options for the sixth question are appearance, bleeding, getting larger, itching, burning, throbbing, aching and other. The seventh item is duration of skin problem. The possible options are one week, one month, less than 6 months, a year, more than one year or more than 5 years. The eighth item ask if patient has a history of skin cancer or melanoma and you could either circle yes or no. The ninth item is the list of skin medication previously used. The tenth item is the list of oral medications the patients is currently taking. The eleventh question is provider suggested diagnosis. Any additional information the provider would like the dermatologist to know will be written under provider notes.

The medical assistant can complete items 1, 2, 3, 8, 9 and 10. The provider will complete items 4, 5, 6, 7 and 11 and review the items completed by the medical assistant.

Thanks for your kind attention. Now I can answer questions before we complete a post-survey.

APPENDIX D:  
SKIN ASSESSMENT FORM

## Skin Assessment Form

1. Name: \_\_\_\_\_

2. DOB: Age: Sex: Male \_\_\_\_ Female \_\_\_\_

3. Known drug allergies \_\_\_\_\_

4. Location of skin problem \_\_\_\_\_

**5. Skin problem**

\_\_\_\_ Rash

\_\_\_\_ Lesion

\_\_\_\_ Mole

Other \_\_\_\_\_

**6. How does skin problem bother you?**

\_\_\_\_ Appearance

\_\_\_\_ Bleeding

\_\_\_\_ Getting larger

\_\_\_\_ Getting darker

\_\_\_\_ Itching

\_\_\_\_ Burning

\_\_\_\_ Throbbing

\_\_\_\_ Aching

Other \_\_\_\_\_

**7. Duration of skin problem**

\_\_\_\_ 1 week

\_\_\_\_ 1 month

\_\_\_\_ Less than 6 months

\_\_\_\_ 1 year

\_\_\_\_ More than 1 year

\_\_\_\_ More than 5 years

8. Does patient or their parents have a history of skin cancer or melanoma? Yes  
No

9. Skin medication previously used (name, concentration and total time used)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10. Oral medication previously used (dose and total time used)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

11. Suggested diagnosis \_\_\_\_\_

\_\_\_\_\_

Provider Notes:

---

---

---

APPENDIX E:  
PRE-SURVEY

## Pre-Survey

1. Job title
  - a. Medical doctor
  - b. Nurse practitioner
  - c. Medical assistant
  - d. Other (please specify)
2. Years of professional experience
  - a. < 1 year
  - b. 1-5 years
  - c. 6-10 years
  - d. 10 years
3. Length of experience with teledermatology
  - a. Less than 1 year
  - b. 1-5 years
  - c. 6-10 years
  - d. Greater than 10 years
4. Number of skin pictures to be taken for a teledermatology consult
  - a. 1-2
  - b. 3-5
  - c. 6-10
5. After skin pictures are taken, they should be \_\_\_\_\_
  - a. reviewed with referring provider
  - b. reviewed with another medical assistant
  - c. uploaded in chart without reviewing
6. When should all teledermatology documentation be completed after consult?
  - a. same day
  - b. 2-3 days
  - c. 4-5 days
7. When should the referral coordinator send out a teledermatology referral?
  - a. same day
  - b. 2-3 days
  - c. 4-5 days
8. When do you expect to get a response from the dermatologist?
  - a. within 2 days
  - b. 3-5 days
  - c. 5-7 days

APPENDIX F:  
POST-SURVEY

## Post-Survey

1. Job title
  - a. Medical doctor
  - b. Nurse practitioner
  - c. Medical assistant
  - d. Other (please specify)
2. Years of professional experience
  - a. < 1 year
  - b. 1-5 years
  - c. 6-10 years
  - d. 10 years
3. Length of experience with teledermatology
  - a. Less than 1 year
  - b. 1-5 years
  - c. 6-10 years
  - d. Greater than 10 years
4. Number of skin pictures to be taken for a teledermatology consult
  - a. 1-2
  - b. 3-5
  - c. 6-10
5. After skin pictures are taken, they should be \_\_\_\_\_
  - a. reviewed with referring provider
  - b. reviewed with another medical assistant
  - c. uploaded in chart without reviewing
6. When should all teledermatology documentation be completed after consult?
  - a. same day
  - b. 2-3 days
  - c. 4-5 days
7. When should the referral coordinator send out a teledermatology referral?
  - a. same day
  - b. 2-3 days
  - c. 4-5 days
8. When do you expect to get a response from the dermatologist?
  - a. within 2 days
  - b. 3-5 days
  - c. 5-7 days

Complete the following form about the skin assessment form

	Strongly Disagree	Disagree	Neither	Agree	Strongly agree
Questions/Grading:	1	2	3	4	5
9. The skin assessment form is simple and straight forward					
10. The skin assessment form captures the necessary information needed by the dermatologist					
11. The skin assessment form will save time and effort					
12. The skin assessment form will prevent omission					
13. The skin assessment form will ensure consistency					
14. The skin assessment form will be easy to use					
15. The skin assessment form can be completed during patient visit					
16. I will be willing to use the skin assessment form for teledermatology					
17. This form will decrease provider documentation time					

18. How useful was the education provided on the skin assessment form

Very Useful     Somewhat useful     Not at all useful

19. Please provide any suggestions for future education or changes that could be made to the skin assessment form.

---



---



---



---



---

APPENDIX G:  
SYNTHESIS OF EVIDENCE

Author's Last Name/Publication Year	Title of Publication	Type of Study	Main Outcomes of Findings	Support for or Link to Project
Carter, Z. A., Goldman, S., Anderson, K., Li, X., Hynan, L. S., Chong, B. F., & Dominguez, A. R. (2017).	Creation of an internal teledermatology store-and-forward system in an existing electronic health record: A pilot study in a safety-net public health and hospital system.	Pilot study	<ol style="list-style-type: none"> <li>1) The average time for patient evaluation was 0.5 days for teledermatology and 70 days for in-person referrals.</li> <li>2) The average time for treatment based on dermatologist recommendation was 3.0 days for teledermatology and 73.5 days for in-person referrals.</li> <li>3) Diagnostic concordance between teledermatology and dermatology clinic was 89.7%. The diagnostic concordance between PCP and teledermatology was 38.0%.</li> <li>4) For patient prescribed medication by teledermatologist, the PCP adherence to recommendation was 93%.</li> <li>5) There was no statistically significant difference in dermatology related emergency room visits before and after the institution of teledermatology.</li> <li>6) Many providers did not document the status of the skin problem during follow up visits.</li> </ol>	<ol style="list-style-type: none"> <li>1) Teledermatology is reliable because it had a significant level of diagnostic concordance with the dermatology clinic.</li> <li>2) Patient's skin conditions can be evaluated quicker through teledermatology compared to seeing a dermatologist face-to-face.</li> <li>3) Teledermatology also enables PCP to start treatment early.</li> </ol>

Author's Last Name/Publication Year	Title of Publication	Type of Study	Main Outcomes of Findings	Support for or Link to Project
Cumsky et al. (2019).	Impact of standardized templates and skin cancer learning modules for teledermatology consultation.	Prospective study	<ol style="list-style-type: none"> <li>1) The use of standardized templates resulted in an absolute reduction in face-to-face referrals by 15.1%.</li> <li>2) Teledermatology consultation increased the absolute diagnosis and management concordance and decreased the absolute diagnosis and management discordance.</li> <li>3) Educational sessions improved the management and referral rates overall.</li> <li>4) A large (87%) number of providers felt the teledermatology process improved care and will use it in the future.</li> </ol>	<ol style="list-style-type: none"> <li>1) Standardized templates could be used to develop checklist to be used for teledermatology quality improvement.</li> <li>2) Appropriate documentation could decrease face-to-face dermatology referral and possibly other processes for teledermatology.</li> </ol>
Maly et al. (2019)	Impact of standardized templates and learning modules on teledermatology consultation.	Prospective study	<ol style="list-style-type: none"> <li>1) The use of standardized templates decreased the percentage of face-to-face dermatology referral from 53% to 38.1%.</li> <li>2) The use of a standardized template increases diagnostic concordance and management by 33% and 26% respectively.</li> <li>3) Most primary care providers were satisfied with teledermatology consults.</li> </ol>	<ol style="list-style-type: none"> <li>1) Implementing standardized intake templates increased the effectiveness of teledermatology consultation.</li> <li>2) Standardized templates can be used to design checklist.</li> </ol>

Author's Last Name/Publication Year	Title of Publication	Type of Study	Main Outcomes of Findings	Support for or Link to Project
Naka, F., Lu, J., Porto, A., Villagra, J., Wu, Z. H., & Anderson, D. (2018).	Impact of dermatology econsults on access to care and skin cancer screening in underserved populations: A model for tele dermatology services in community centers.	Retrospective cohort study	<ol style="list-style-type: none"> <li>1) Fifty-nine percent of patients in the econsult group received an appointment to see a dermatologist and only 11% of patients in the non econsult group has confirmed appointment with the dermatologist.</li> <li>2) Average eConsult completion time was less than 24 hours compared to a median time of 77 days for consult completion before econsult.</li> <li>3) All patients referred to the dermatologist for eConsults received a diagnosis and treatment recommendations sooner than patients referred for face-to-face dermatology visits.</li> <li>4) Eighty-five percent of primary providers who responded to the survey were satisfied with the eConsult process.</li> <li>5) Eighty four percent of skin conditions could be managed by econsults and prevent face-to-face dermatology visits.</li> </ol>	

Author's Last Name/Publication Year	Title of Publication	Type of Study	Main Outcomes of Findings	Support for or Link to Project
Philip, J., Frieden, I., & Cordoro, K. (2013)	Pediatric teledermatology consultations: Relationships between provided data and diagnosis.	Retrospective cohort study	<ol style="list-style-type: none"> <li>1) Seventy-five percent of skin condition were diagnosed using teledermatology regardless of information provided.</li> <li>2) Teledermatology consults can decrease the need for an in-person dermatology consultation in the majority of cases.</li> <li>3) Only historical information that had an impact on diagnosis was previous treatment.</li> <li>4) A lack of diagnosis was significantly associated with a recommendation for referral for biopsy.</li> </ol>	<ol style="list-style-type: none"> <li>1) Most skin conditions can be managed through teledermatology.</li> <li>2) Standardized templates for teledermatology does not influence diagnosis.</li> <li>3) More research is needed to determine the benefits of standardized documentation templates for teledermatology.</li> </ol>
Piette, E., Nougairède, M., Vuong, V., Crickx, B., & Tran, V.-T. (2017).	Impact of a store-and-forward teledermatology intervention versus usual care on delay before beginning treatment: A pragmatic cluster-randomized trial in ambulatory care.	Cluster-randomized trial	<ol style="list-style-type: none"> <li>1) The average time between initial consultation by the general practitioner (GP) and reply received from the dermatologist was 4 days in the intervention group and 40 days for the control group.</li> <li>2) Patients in the intervention group for whom the dermatologist was unable to come up with a diagnosis or treatment plan based on pictures sent, the average time before face-to-face consultation was 27 days.</li> </ol>	<ol style="list-style-type: none"> <li>1) Teledermatology is beneficial to both patients and providers.</li> <li>2) Teledermatology should be adopted in most rural settings.</li> <li>3) Teledermatology should be used to bridge the gap of dermatologist shortage in shortage areas.</li> </ol>

Author's Last Name/Publication Year	Title of Publication	Type of Study	Main Outcomes of Findings	Support for or Link to Project
			<p>3) In addition, 85% of patients in the intervention group and 10% of patients in the control group received dermatologist recommendation within 15days enabling the GP to initiate care.</p> <p>4) Some 47.2% of patient in the intervention group did not need to see a dermatologist face-to-face.</p> <p>5) In the intervention group 84.9% of patients were satisfied and 71.7% of patients thought the treatment time was short. In the control group, 94% of the patients were satisfied and 46% of patients thought the treatment time was short.</p> <p>6) 69.2% of providers in both the intervention and control group were globally satisfied. With regards to time-to treatment satisfaction, 76.7% of GP in intervention group thought treatment time was short meanwhile 53% of GPs in control group thought treatment time was short.</p> <p>7) The dermatologist thought that 20.75% of the</p>	

Author's Last Name/Publication Year	Title of Publication	Type of Study	Main Outcomes of Findings	Support for or Link to Project
			photographs had poor quality and insufficient for them to make a diagnosis.	
Yang, X., Barbieri, J. S., & Kovarik, C. L. (2019).	Cost analysis of store-and-forward teledermatology consults system in Philadelphia.	Retrospective analysis	<ol style="list-style-type: none"> <li>1) 86% of the cases were addressed through teledermatology.</li> <li>2) Teledermatology decreased in-person dermatology visits and ER visits.</li> <li>3) Cost saving for using teledermatology rather than referring to a dermatologist ranged from \$6997.30 to \$36,8754.40.</li> <li>4) Cost saving for emergency room visits was \$15,525 - 29,279 and unnecessary clinic visits was \$2967.30 - \$48,951.</li> </ol>	<ol style="list-style-type: none"> <li>1) Store-and-forward teledermatology is cost effective.</li> <li>2) Teledermatology increases access to dermatologic care.</li> <li>3) Most skin conditions can be managed through teledermatology.</li> </ol>

APPENDIX H:  
SITE APPROVAL LETTER



February 7, 2020

University of Arizona Institutional Review Board  
 c/o Office of Human Subjects  
 1618 E Helen St  
 Tucson, AZ 85721

Dear members of the board:

Please note that Ms. Awungcha Nkemzi, UA Doctor of Nursing Practice student, has permission of the Mariposa Clinic to conduct a quality improvement project at our facility for her project, "Educating provider and Medical Assistants on a skin assessment form for Teledermatology consults."

Ms. Awungcha Nkemzi will conduct a voluntary pre and post survey of health care providers and medical assistants utilizing teledermatology services at Mariposa Clinic after a one-day in-service on a skin assessment form that could be used to document teledermatology consults. Ms. Awungcha's activities will be completed by *April 30, 2020*.

Ms. Awungcha Nkemzi has agreed to provide to my office a copy of the University of Arizona Determination before she recruits participants. She will also will present aggregate results to the providers at their monthly staff meeting.

If there are any questions, please contact my office.

Sincerely,

---

Eladio Pereira, MD, MBA, FACP  
 Chief Medical Officer  
 Mariposa Community Health Center

V 2013-01

An equal opportunity affirmative action employer. All qualified persons, including the handicapped, are encouraged to participate.

MARIPOSA COMMUNITY HEALTH CENTER, INC. ■ 1852 N. MASTICK WAY ■ NOGALES, ARIZONA 85621 ■ (520) 281-1550

APPENDIX I:  
THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD APPROVAL  
LETTER



Human Subjects  
Protection Program

1618 E. Helen St.  
P.O. Box 245137  
Tucson, AZ 85724-5137  
Tel: (520) 626-6721  
<http://hgw.arizona.edu/compliance/home>

**Date:** February 28, 2020  
**Principal Investigator:** Awungcha Sandra Nkemzi  


---

**Protocol Number:** 2002416231  
**Protocol Title:** EDUCATING PROVIDERS AND MEDICAL ASSISTANTS ON  
 A SKIN ASSESSMENT FORM FOR TELEDERMATOLOGY  
 CONSULTS

**Determination:** Human Subjects Review not Required

**Documents Reviewed Concurrently:**

**HSPF Forms/Correspondence:** *determination of human research.pdf*

**Regulatory Determinations/Comments:**

- Not Research as defined by 45 CFR 46.102(1): As presented, the activities described above do not meet the definition of research cited in the regulations issued by U.S. Department of Health and Human Services which state that "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research."

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPF) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the study activity. Please contact the HSPF to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

## REFERENCES

- Arora, P. G., Connors, E. H., Blizzard, A., Coble, K., Gloff, N., & Pruitt, D. (2017). Dissemination and implementation science in program evaluation: A telemental health clinical consultation example. *Elevation and Program Planning*, *60*, 56-63. Retrieved from <https://doi.org/10.1016/j.evalprogplan.2016.09.003>
- American Hospital Association. (2019). *Fact sheet: Telehealth*. Retrieved from <https://www.aha.org/system/files/2019-02/fact-sheet-telehealth-2-4-19.pdf>
- Arizona Department of Health Services. (2017). *Arizona melanoma profile*. Retrieved from <https://www.azdhs.gov/documents/preparedness/public-health-statistics/cancer-registry/reports/arizona-melanoma-profile-2017.pdf>
- Arizona Skin Cancer Institute. (2019). *Skin cancer in Arizona*. Retrieved from <https://azskincancerinstitute.org/sci/about/arizona>
- Burnes, B. (2014). Kurt Lewin and the planned approach to change: A re-appraisal. *Journal of Management Studies*, *41*(6), 977-1002. doi.org/10.1111/j.1467-6486.2004.00463.x
- Carter, Z. A., Goldman, S., Anderson, K., Li, X., Hynan, L. S., Chong, B. F., & Dominguez, A. R. (2017). Creation of an internal teledermatology store-and-forward system in an existing electronic health record: A pilot study in a safety-net public health and hospital system. *JAMA Dermatol*, *153*(7), 644-650. doi:10.1001/jamadermatol.2017.0204
- Centers for Disease Control and Prevention. (2012). *Program performance and evaluation office*. Retrieved from <https://www.cdc.gov/eval/guide/introduction/index.htm#Framework>
- Dorsey, E. R. & Topol, E. J. (2016). State of telehealth. *The New England Journal of Medicine*, *375*, 154-161. doi:10.1056/NEJMra1601705
- Feng, H., Berk-Krauss, J., Feng, P. W., & Stein, J. A. (2018). Comparison of dermatologist density between urban and rural counties in the United States. *JAMA Dermatology*, *154*(11), 1265-1271. doi:10.1001/jamadermatol.2018.3022
- Health Resources and Service Administration. (n.d.). *HPSA find*. Retrieved from <https://data.hrsa.gov/tools/shortage-area/hpsa-find>
- Health Resources and Services Administration. (n.d.). *MUA find*. Retrieved from <https://data.hrsa.gov/tools/shortage-area/mua-find>
- Grif Alspach, J. (2017). The checklist: Recognize limits, but harness its power. *Critical Care Nurse*, *37*(5), 12-18. Retrieved from <https://doi-org.ezproxy3.library.arizona.edu/10.4037/ccn201760>

- In, J. & Lee, S. (2017). Statistical data presentation. *Korean Journal of Anesthesiology*, 70(3), 267-276. doi:10.4097/kjae.2017.70.3.267
- Johnston, M. & Magnan, M. A. (2019). Using a fall prevention checklist to reduce hospital falls: Results of a quality improvement project. *AJN American Journal of Nursing*, 119(3), 43-49. Retrieved from <https://doi-org.ezproxy1.library.arizona.edu/10.1097/01.NAJ.0000554037.76120.6a>
- Lim, H. W., Collins, S. A. B., Resneck Jr, J. S., Bologna, J. L., Hodge, J. A., Rohrer, T. A., Van Beek, M. J., Margolis, D. J., Sober, A. J., Weinstock, M. A., Nerenz, D. R., Begolka, W. S., & Moyano, J. V. (2017). The burden of skin diseases in the United States. *Journal of the American Academy of Dermatology*, 76(5), 958-972.e2
- Maly, C., Cumsy, H., Costello, C., Buras, M., Ranieri, L., Grover, M., Comfere, N., Nelson, S., Pittelkow, M., & Mangold, A. (2019). Impact of standardized templates and learning modules on teledermatology consultation. *Journal of the American Academy of Dermatology*, 81(4), Supplement 1, p. AB77. Retrieved from <https://doi.org/10.1016/j.jaad.2019.06.303>
- Mariposa Community Center. (n.d.). *History*. Retrieved from <https://mariposachc.net/home-style-3/history/>
- Melia, K. (2014). Principles at the root of ethical debate. In *Ethics for nursing and healthcare practice* (pp. 17-21). London, United Kingdom: Sage Publications, Inc. doi:10.4135/9781526435903.n2
- Miracle, V. (2016). The Belmont report: The triple crown of research ethics. *Dimens Crit Care Nurs*, 35(4), 223-228. doi:10.1097/DCC.000000000000186
- Mishra, P., Pandey, C., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia*, 22(1), 67. Retrieved from [https://link-gale-com.ezproxy3.library.arizona.edu/apps/doc/A569567549/AONE?u=uarizona\\_main&sid=AONE&xid=89b5da6](https://link-gale-com.ezproxy3.library.arizona.edu/apps/doc/A569567549/AONE?u=uarizona_main&sid=AONE&xid=89b5da6)
- Myers, D., Helming, D., Mutrux, R., Fleming, D. A., & Edison, K. E. (2018). Dermatology ECHO-an innovative solution to address limited access to dermatology expertise. *Rural and Remote Health*, 18, 4415. <https://doi.org/10.22605/RRH4415>
- National Cancer Institute. (2019). *Skin cancer screening (PDQ) - Patient version*. Retrieved from <https://www.cancer.gov/types/skin/patient/skin-screening-pdq>

- National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1979). *The Belmont report: Ethical principles and guidelines for the protection of human subjects of research*. Retrieved from <https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/read-the-belmont-report/index.html>
- Shirley, M. (2013). Lewin's theory of planned change as a strategic resource. *The Journal of Nursing Administration*, 43(2), 69-72. doi:10.1097/NNA.0b013e31827f20a9
- Skin Care Foundation. (2019). *Early detection: Overview*. Retrieved from <https://www.skincancer.org/early-detection/>
- South West Telehealth Resource Center. (n.d.). *General dermatology form*. Retrieved from [https://southwesttrc.org/sites/default/files/resources/forms/telederm\\_OtherForm\(1\).pdf](https://southwesttrc.org/sites/default/files/resources/forms/telederm_OtherForm(1).pdf)
- Tiffany, C. R. & Lutjens, R. J. (1997). *Planned change theories of nursing: Review, analysis and implications*. Retrieved from <https://eds-a-ebSCOhost-com.ezproxy2.library.arizona.edu/ehost/ebookviewer/ebook?sid=a840ad62-7b53-45ce-9d56-a2dfcb586d84%40sdc-v-sessmgr03&vid=0&format=EB>
- Tuckson, R. V., Edmunds, M., & Hodgkins, M. L. (2017). Telehealth. *The New England Journal of Medicine*, 377, 1585-1592. doi:10.1056/NEJMSr1503323
- United States Census Bureau. (n.d.). *Quick facts*. Retrieved from <https://www.census.gov/quickfacts/nogalescityarizona>
- Vimalananda, V. G., Gupte, G., Seraj, S. M., Orlander, J., Berlowitz, D., Fincke, B. G., & Simon, S. R. (2015). Electronic consultations (e-consults) to improve access to specialty care: A systematic review and narrative synthesis. *Journal of Telemedicine and Telecare*, 21(6), 323-330. <https://doi.org/10.1177/1357633X15582108>