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Limited Access to Dermatology Specialty Care: Barriers and Teledermatology

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ABSTRACT

Introduction: Access to dermatology specialty care is limited in the underserved population. Barrier identification and exploring the potential role of teledermatology are the first steps to address this problem.

Objectives: Identify the barriers to dermatologist care for the diagnosis and treatment of melanoma and non-melanoma skin cancers in the underserved population. Additionally explored was the potential role of teledermatology to provide dermatology care access in the underserved population.

Methods: A quantitative descriptive study was conducted via an online survey instrument. The survey's barriers portion was adapted from the 1998 Ohio Family Health Survey (OFHS). The survey's teledermatology portion was adapted from the McFarland Teledermatology Provider and Imaging Technician Satisfaction Survey. The participants were practicing dermatologists and members of Georgia, Missouri, Oklahoma, and Wisconsin dermatology associations. Thirty-eight responded to demographic questions, of which twenty-two responded to the survey items.

Results: The top three barriers ranked as the most concerning were "continually uninsured" (n = 8; 36.40%), "resides in a medically underserved county" (n = 5; 22.70%), and "family under federal poverty level" (n = 7; 33.30%). Teledermatology as a potential role for access to care was supported by convenient delivery of healthcare (n = 6; 72.70%), an addition to regular patient care (n = 20; 90.90%), and increase to patient care access (n = 18; 81.80%).

Conclusion: Barrier identification and teledermatology access to provide care to the underserved population is supported. Further teledermatology research is necessary to address the logistics regarding how to initiate and deliver teledermatology to the underserved.

Introduction

Access to dermatology specialty care is limited in the underserved population and is related to patient socioeconomic status, rural residence status, and provider location distribution [1]. Melanoma and non-melanoma skin cancer in the underserved population have public health repercussions that include poor patient outcomes directly associated with late-stage diagnoses [2]. Barrier identification and dermatology access are the first steps to address the dermatological needs of the underserved population. It is estimated that a 16% increase will occur between 2013 and 2025 for dermatology visits [3]. There are approximately 3.4 dermatologists per 100,000 population, which is lower than what is needed to provide adequate dermatology care in communities [4]. This overall dermatology access shortage includes 67.10% in dedicated medical dermatology patient care time [5].The combination of the rise in skin cancer rates, extended wait times, increased need for dermatology visits, and the shortage of practicing dermatologists prompts a valid public health concern. This concern is exacerbated by barriers to care for the underserved. Innovative methods are necessary for patients to have sufficient access to dermatologist care [5].

Teledermatology allows providers to diagnose and recommend treatment and address the limited dermatology specialty care access in the underserved population. One of the main teledermatology applications is to triage dermatology patients with higher morbidity and mortality risks to facilitate earlier in-person visits [6]. This access accommodates early detection of potentially lethal dermatological diseases such as melanoma and non-melanoma skin cancers. The barrier-focused framework included patient income, lack of insurance, and where the underserved population seeks health care. The poor, those who live in rural areas, and high minority locations lack access to dermatologists [1]. There is a need for additional research-tested programs for dermatologic treatment for underserved communities [2]. To address and explore potential treatment intervention programs, barrier identification for dermatologist care of skin cancers in the underserved population is necessary in closing the gap of dermatologic specialty care of melanoma and non-melanoma skin cancers to the underserved population. Current research also includes the use of teledermatology for general dermatology care; however, there is a scarcity of teledermatology to provide access for diagnosis and treatment of melanoma and non-melanoma skin cancers in the underserved population.

Early detection that leads to earlier diagnosis and treatment of melanoma and non-melanoma skin cancers improves patient care outcomes and reduces morbidity and mortality [7]. Barrier identification is the first step to find and improve interventions to address and resolve these obstacles.

Objectives

The purpose of this quantitative descriptive research study was to identify the barriers to dermatologist care for diagnosis and treatment of melanoma and non-melanoma skin cancers in the underserved population. Additionally explored was the potential role of teledermatology to provide access to this care in this population.

Methods

The research design was a quantitative descriptive study via a survey instrument. The study participants were practicing dermatologists who were members of either Georgia, Missouri, Oklahoma, or Wisconsin dermatology associations. The respective state dermatology associations sent the surveys to the memberships. The accessible population included 700 dermatologists. The estimate of this population size with a confidence level of 95%, a margin of error at 5%, and the estimated 10% response rate indicates 248 participant responses was the optimal sample size [8]. A total of 38 responded to demographic questions, of which 22 responded to the survey items. The cover letter served as the survey participation invitation with the inserted SurveyMonkey link. Survey responses were anonymous with computer password protection. The survey data collection range was February 2019 – April 2019. The inclusion criteria were (a) a practicing dermatologist who is a member of his or her respective state dermatology association in the states of Georgia, Missouri, Oklahoma or Wisconsin; and (b) between the ages of 25 through 64. The exclusion criteria were (a) a non-practicing dermatologist in any state and (b) below the age of 25 or above the age of 64. The sampling methodology was quantitative. The sampling methodology was non-probability consecutive sampling.

The barriers portion of the survey was adapted from the 1998 Ohio Family Health Survey (OFHS), which was developed through the Ohio Department of Health [9]. Ten rank-order barriers were adapted regarding access to dermatological specialty care. Permission to use and adapt the data collection tool, "McFarland Teledermatology Provider and Imaging Technician Satisfaction Survey" was requested, approved, and received by the author Dr. Lynne McFarland. Nineteen items on a 5-point Likert scale were adapted for the teledermatology items. The demographic portion of the survey included dichotomous, classificatory, and rank-order responses. The demographics included age, sex, degrees, income, and race. Also included in the demographics were practice setting, practice-setting location, and if the participant had received training in teledermatology.

The validity and reliability of the "McFarland Teledermatology Provider and Imaging Technician Satisfaction

Survey" was based on the validated PSQ originally developed by Ware et al. that classifies similar items [10]. The questions were from a standardized, validated, and reliable instrument (Cronbach's alpha = 0.72-0.92 over the domains for internal consistency) and construct validity regarding multiple patient settings. According to McFarland, this instrument was for telemedicine in general, but not specifically teledermatology. McFarland's questions were dermatologist and medical provider vetted for concerns and satisfaction areas [10]. The satisfaction domains were recommended by a review of Kraai et al. telemedicine satisfaction surveys [10]. Two dermatologist subject-matter experts were enlisted to establish face and content validity for this study's survey. The feedback included the addition of the practice setting to specify academic, private, or hospital, and the practice setting location to specify urban, rural, or suburban. Feedback also included if the participant had teledermatology training.

Descriptive statistical analysis was conducted using IBM SPSS Statistics Version 25. Frequencies and percentages were reported for nominal demographic variables. Frequencies, percentages, median, and IQR were reported for ordinal demographic variables. Ratio level data were tested for normality using the Shapiro-Wilk test ($\alpha < .05$) and the median and IQR were reported. The barriers were rank-ordered with frequencies and percentages noted. A 5-point Likert scale was used to rate the responses of the teledermatology items. Because the statements were adapted from a standardized data collection instrument and not all of the original questions were included, an item-by-item analysis was conducted. Frequencies and percentages were reported for the teledermatology items as well. Findings for rank-ordered barriers and teledermatology items were included both in text and in a tabular format.

Results

An estimated 700 potential participants received the survey via the four dermatologist societies. Thirty-eight participants responded to demographic questions. Of the 38 respondents, 22 responded to the survey items. The remaining 16 surveys were excluded due to not meeting inclusion criteria or not answering the barrier or teledermatology item sets. The approximate number of participants that received surveys was 700, which represents a 5.43% overall response rate. The complete survey response rate was 3.14%. Testing for normality for the age demographic was completed by using the Shapiro-Wilk test ($p = .005$). The median age was 54 (IQR = 17) years (see Table S1). The majority of the respondents were male (n = 13; 54.20%), and most held MD degrees (n = 25; 65.80%). Annual income was tested for normality using the Shapiro-Wilk test. The median income was $200,000 or more (IQR = 0). Most practice settings were private (n = 24; 96.00%), and the location setting majority was suburban practice (n = 15; 60.00%). Most dermatologists did not have teledermatology training (n = 14; 56.00%) (see Table S1).

Research question 1. The first research question addressed the rank-ordering of the barriers to dermatologist care for the diagnosis and treatment of melanoma and non-melanoma skin cancers in the underserved population. Ten barriers were rank-ordered by the respondents in order of greatest to least concerning barrier (see Table S2). The top three barriers ranked as the most concerning were "continually uninsured" (n = 8; 36.40%), "resides in a medically underserved county" (n = 5; 22.70%), and "family under federal poverty level" (n = 7; 33.30%), respectively (see Table S3).

Research question 2. The second research question addressed the potential role of teledermatology in providing access to dermatologist care for the diagnosis and treatment of melanoma and non-melanoma skin cancers in the underserved population. The respondents rated each statement on a 5-point Likert scale ranging from strongly disagree = 1 to strongly agree = 5. The scale ratings were collapsed to produce a dichotomous response for each statement item. Strongly disagree and disagree were combined as well as strongly agree and agree were combined. No opinion was removed from the analysis results to maintain dichotomous results (see Table S4).

This study found that the major barriers to the diagnosis and treatment of melanoma and non-melanoma in the underserved population were related to insurance status, medically underserved county residence, and income level. The greatest barrier was "continually uninsured patients", followed by "resides in a medically underserved county", and "family under federal poverty level". The results regarding the barriers of "resides in a medically underserved county", and "family under federal poverty level" support the research by Vaidya[1] that the poor access to dermatology specialty care in the underserved population is related to patient socioeconomic status, rural residence, and provider location distribution. Research results by Campagna et al. [11] additionally support that limited access to dermatology specialists is due to rural residence and socioeconomic barriers in the underserved population. The highest-ranked barrier of continually uninsured identified in this study supports the research of Nelson et al. [12] that uninsured, Medicaid, and rural patients have increased wait times for dermatology office visits. The appointment waiting time for this population to see a dermatologist delays diagnosis and subsequent treatment. This result is also supported by the research of Pasquali et al. [13] that a benefit of teledermatology provided dermatology specialty care access to patients in remote areas and patients on long waiting lists.

The conceptual barrier-focused framework included the lack of insurance, where the underserved population seeks healthcare access, and patient income, which was supported by this study's findings. The status of the patients' health, insurance, and income was among barriers associated with the lack of a regular healthcare source [9]. Barrier identification is the first step to resolve access and care. Innovative methods are necessary for patients to have sufficient access to dermatologist care [5].

This study also found that the role of teledermatology in providing access to dermatological specialty care for diagnosis and treatment of melanoma and non-melanoma is a viable option in the underserved population. This finding supports Levitt et al. [6] that using teledermatology in the underserved population increases access to care for this population. The results of this study found that dermatologists agreed regarding the ability to describe and assess dermatology diagnoses and treatment needed as well as monitor the patients' conditions via teledermatology. These findings agree with Leavitt et al. [6] that teledermatology contributes to accurate diagnoses with consistency. Teledermatology could increase access to dermatology care, which would ease the ability for patients to contact a dermatologist. The increase in access is supportive of earlier patient care, which could benefit earlier skin cancer detection. These results also support the premise of Apalla et al. [7] that early detection leads to early diagnosis and treatment of melanoma and non-melanoma skin cancers and improves patient care outcomes, reducing morbidity and mortality. Research by Fludiona et al. [14] provides additional support regarding early detection, reporting that suspicious neoplasms were the top diagnosis that recommended accelerated face-to-face consultation for teledermatology patients. Teledermatology is the clinical diagnostic technology of choice for patients who have concerning lesions with access barriers to care per Skudalski et al. [15].

Teledermatology was found to be a convenient form of healthcare delivery and a standard form of healthcare delivery for the future. These results support Nelson et al. [12] that teledermatology complements outpatient dermatology healthcare delivery. This study found that dermatologists were willing to add teledermatology to the regular patient care received and agreed there was no threat to patient confidentiality and privacy. These results support McFarland et al. [10] also showing majority agreement in the same areas. The results of this study indicated that the logistics of using the camera and computer in teledermatology were not difficult; however, trusting the equipment to work was a concern. These results were in agreement with McFarland regarding whether the equipment was easy to use; however, it was in opposition regarding whether the equipment was trusted to work. The findings in this study showed that the preference was face-to-face patient visits over teledermatology, and the lack of physical contact for the physical exam was a concern. These results did not support McFarland, which reports a slight preference for teledermatology over face-to-face visits, as well as the lack of physical contact, which was sufficient. The results of this study included the recognition of the need for access and care for the underserved population, which supported Jacobsen et al. [2] showing there is a need for additional research-tested programs for the treatment of the underserved population.

The sample size of this study was relatively small compared to the number of U.S. dermatologists. The small sample size limits the generalizability of this study, and the results are suggestive to the population.

The findings of this study identified and rank-ordered the barriers to the diagnosis and treatment of melanoma and non-melanoma skin cancers in the underserved population. These identified findings can be addressed by healthcare providers and administrators to begin to overcome these barriers for patients. The results also indicate that there is a potential role for teledermatology to provide access to dermatology specialty care. These findings can also be used by healthcare providers and administrators to not only address the barriers but to begin the logistical and financial process to provide teledermatology services. By opening the dialogue of barrier identification and teledermatology potential, dermatology diagnosis and treatment of melanoma and non-melanoma skin cancers can result in better patient care and outcome.

A limitation of this study was the small sample size, which reduced the generalizability of the study results. The sampling method was also a limitation, as it did not reach a large enough number of practicing dermatologists. Due to the time allotted for this study, a limitation was also addressing two different research questions as opposed to one. Even though they are related to each other, separate studies would allow greater focus and more in-depth research for each question.

Recommendations for future research include attempting to resolve the limitations discussed for this study, such as obtaining a larger sample size by additional participant requests and devoting more research time. A recommendation for research includes exploring the logistics and costs associated with providing teledermatology to the underserved as well as patient transportation for follow up face-to-face visits. The cost and payment of treatment, how to initially launch teledermatology, and operational requirements also need to be researched to address the need for care of the underserved. This research process has shown that each item identified opens up new avenues to be explored and studied.

Conclusion

The purpose of this study was to identify the barriers to the diagnosis and treatment of melanoma and non-melanoma skin cancers in the underserved population, as well as the potential role of teledermatology to provide access to dermatologist care. The most concerning barriers, namely "continually uninsured", "resides in a medically underserved county", and "family under federal poverty level", prompt the need for additional research to address and overcome these barriers. These barriers raise public issues of affordable health care, healthcare provider incentive to practice in underserved locations, and the effect of poverty regarding healthcare. There is support for the potential role of teledermatology to provide dermatology care for the underserved. Even though dermatologists did prefer face-to-face visits over teledermatology as well as a concern for lack of physical contact, the remaining results support teledermatology use. Access barriers are also concerning in other countries including India, Madagascar, and Senegal due to a low dermatologist-to-population ratio. [13]. In addition to identifying barriers to specialty dermatology access for the underserved population, teledermatology includes training to cover basic dermatological conditions on a global scale [13]. Within the scope of this study, the access-to-care barriers regarding general skin care versus specialty dermatological care are the same, as the focus is in regards to the underserved population. Further research is needed to address the logistics to initiate and deliver teledermatology to the underserved, as well as the costs to provide access, treatment cost, and patient transportation. In summary, identifying the barriers as the first step to providing dermatology care for the underserved raises the need for more research to address and find resolutions. The role of teledermatology to provide access is supported, but there is also a need for further research to explore the logistics and costs to provide this service to the underserved.

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