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Extending the Scope of Telemedicine to Podiatric Medicine

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Abstract. The COVID-19 pandemic has accelerated the adoption of telemedicine in healthcare. This study explores the feasibility of telemedicine for foot and ankle care in primary settings, using a mixed-methods approach with online questionnaires, focus groups, and interviews. Stakeholders, including patients, podiatrists, and senior healthcare managers, agreed on the need for a telemedicine service. Recommendations include creating evidence-based guidelines, providing professional training, and enhancing community education. The research highlights the necessity for structured telemedicine services, identifying gaps in existing pandemic responses and the need for further guidelines and training.

Keywords. Podiatry, telemedicine, foot and ankle, evidence-based practice, technology, public health informatics.

1. Introduction

Telemedicine has evolved in tandem with technological progress over several decades [1]. Recently, the COVID-19 pandemic has emphasised the essential nature of telemedicine in various healthcare settings [2].

Healthcare providers with a special interest in foot and ankle management frequently employ physical interventions within their clinical practice to assess, diagnose, and manage diverse foot conditions, due to the tactile nature of their occupation. The COVID-19 pandemic necessitated an abrupt shift in podiatric care from a traditional clinical setting to a remote one, because of the implementation of improvised measures [1]. During that period, healthcare providers faced a dearth of comprehensive evidence-based guidelines to comply with, and the guidelines that were formulated were primarily institutional [3]. The principal aim of the research was to examine the viewpoints of stakeholders regarding the possible implementation of a telemedicine service for foot and ankle care management in the primary healthcare setting. In terms of this paper, telemedicine is defined as the application of information and communication technology

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to enable healthcare providers and patients to engage in consultations [4]. Assessing the perspectives of stakeholders will play a crucial role in ascertaining the viability of this potential service in achieving broad adoption.

2. Method

The research applied a mixed-methods technique, as can be seen in Figure 1. Participants aged 18 years or older who had received podiatric care in the public primary healthcare system within the preceding 24 months were recruited. Furthermore, state-registered podiatrists and senior health care management who have a close association within the podiatry profession were interviewed to explore their views regarding the introduction of podiatric telemedicine service. Ethical approval was sought and granted before the commencement of the study.

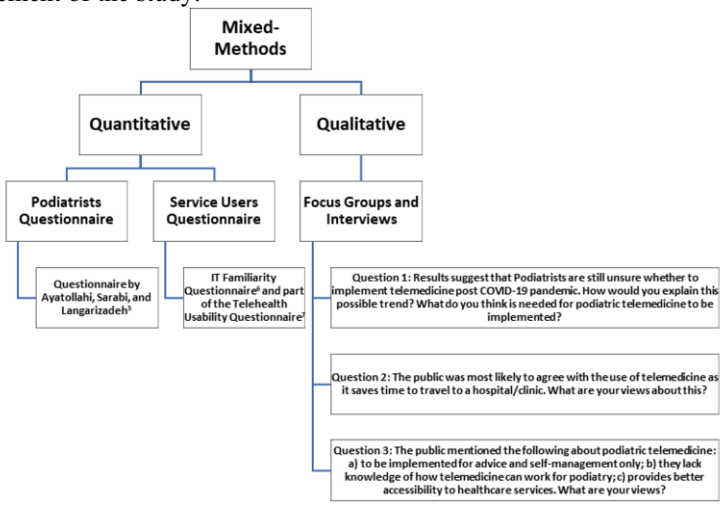

Figure 1. A graphical representation of the mixed-method technique used to describe the tools used to carry out this research.

The questionnaire by Ayatollahi, Sarabi and Langarizadeh [5] was used to interview the podiatrists to explore their perceptions of the use of telemedicine. The questionnaire comprised several closed-ended questions and was scored using a five-point Likert scale, ranging from 1 (very low) to 5 (very high) [5].

The IT Familiarity Questionnaire and the Telehealth Usability Questionnaire (TUQ) questionnaire were used to interview the service users. This comprised eight questions which explored the ability of individuals to use information technology using a Likert scale (1=daily use and 3=no use) [6] and a part of the TUQ, which exclusively incorporated a subset of pertinent and pragmatic questions relevant to the research context, The response options ranged from 1 (representing disagreement) to 7 (representing agreement) [7]. The recruitment process for both questionnaires was conducted through convenience sampling. The questionnaires were disseminated using SurveyMonkey, through a social media platform and a link was shared. SPSS was utilized to analyze the quantitative data for both questionnaires.

After quantitative data analysis, focus groups and interviews were arranged with individuals willing to participate in additional discussions. A series of three online focus groups were conducted, each consisting of five state-registered podiatrists. Additionally, three virtual interviews were conducted with senior managers following the questions (Figure 1). The sessions were recorded, and comprehensive notes were taken throughout. The data collected was evaluated using thematic analysis, which was subsequently verified by two independent raters. In addition, a Cohen-Kappa statistical analysis was conducted to assess the level of inter-rater reliability.

3. Findings

A total of 55 state-registered podiatrists completed the questionnaire and fifteen participated in the focus groups. The results from the podiatrist's questionnaire indicated that the security relating to telemedicine technology was of utmost importance ($\bar{x} = 4.18$, SD = 0.70), whilst clinicians' knowledge on telemedicine technology was the scored lowest ($\bar{x} = 2.11$, SD = 0.63). Furthermore, podiatrists gave a score of below 3 when they were asked whether they would consider using podiatric telemedicine in future consultations indicating that there still existed a degree of uncertainty among podiatrists whether they are willing to adopt telemedicine consultations. In addition, podiatrists have suggested that if they were to consider telemedicine consultation, their first preference would be for pre-operative podiatric care, followed by dermatological and post-operative care, with musculoskeletal and infection cases being ranked as third preference.

With regards to the service user's questionnaire, a total of 171 valid responses were obtained with 68% of the respondents being females and 33% of which were over the age of 50. The utilization of information technology devices was common amongst the service users, except for the use of eBooks, which did not yield any statistically significant findings. The internal consistency of the eight IT familiarity statements was deemed excellent, as evidenced by a Cronbach's alpha coefficient of 0.886.

Figure 2 (A) - A word cloud illustration of the emerged themes from the open-ended question posed to the service users **(B)** - A word cloud illustration of the emerged themes following focus group and interview sessions.

With reference to the service user questionnaire utilizing TUQ, mean scores exhibit an upward trend, indicating that there was a higher likelihood of agreement among the respondents regarding the use of podiatric telemedicine as part of their healthcare. The participants agreed that telemedicine is a time-efficient alternative to physically visiting a healthcare facility ($\bar{x} = 6.10$, SD = 0.18). However, there was a lack of consensus

regarding the comparability of telemedicine consultations to in-person visits ($\overline{x}$ = 3.70, SD = 0.27). The word cloud, as presented in Figure 2A, illustrates the prevalent themes that surfaced from the open-ended questioning posed to the service users, inquiring about their perspectives on podiatric telemedicine. The outcomes from the focus groups conducted among podiatrists and interviews conducted with senior management are illustrated in Figure 2B.

4. Discussion

Whilst results from the questionnaires indicated a lack of consensus amongst podiatrists regarding the potential introduction of podiatric telemedicine into their clinical operations, the thematic analysis emerging from the focus groups and interviews revealed that telemedicine is a promising approach for the future of foot and ankle management. Moreover, the results suggested that a considerable proportion of stakeholders endorsed the adoption of telemedicine in podiatry. Although the authors contend that certain issues must be addressed before implementing such a new service, one needs to acknowledge that telemedicine cannot replace certain aspects of clinical assessment. The importance of telemedicine for enhancement and enabling the accessibility of podiatric care to service users was highlighted by interviewees in senior management positions. Furthermore, it was asserted that it is imperative that during telemedicine podiatric consultations patients' requirements need to be addressed comprehensively.

A recent scoping review reported that the current research on telemedicine practice guidelines concerning the foot and ankle to date are solely focused from an orthopaedic viewpoint, with particular emphasis on musculoskeletal conditions [3]. Stojmanovski et al emphasised the dearth of telemedicine guidelines that are specifically designed for the management of foot and ankle ailments [3]. Additionally, the authors observed that the current guidelines lack adequate non-technical clinical recommendations [3]. Some important considerations before introducing podiatric telemedicine include:

4.1. The establishment of profession-specific guidelines

Profession-specific guidelines for healthcare providers and service users receiving care are imperative. It is expected that the establishment of podiatric telemedicine guidelines will facilitate the implementation of telemedicine in podiatric medicine. In addition, these resources will aid healthcare providers in delivering optimal foot and ankle management to their patients, enabling greater adaptability in podiatric care within a primary healthcare environment.

4.2. The importance of professional development and community outreach

Despite the initial reservations expressed by healthcare stakeholders regarding the proposed service, it has been consistently highlighted that its establishment is imperative, subject to the implementation of appropriate measures and the development and adherence to sound criteria which include the importance of professional development, extensive community outreach, and professional management of service user’s expectations concerning the potential benefits of telemedicine.

4.3. Better patient triaging in clinical settings

The allocation of available slots to patients needing clinical appointments can improve the efficiency of clinical services and mitigate wait times. Furthermore, there would be an enhanced availability of podiatrists for patients to establish direct communication. It is essential to acknowledge that while telemedicine may not be universally efficacious for all podiatric ailments, it has the potential to confer benefits in foot care and footwear guidance, monitoring of orthotic devices, management of musculoskeletal conditions in the lower limb, and treatment of foot infections.

5. Conclusions

Whilst in-clinic podiatry consultations are widely regarded as the preferred method of care, the incorporation of podiatric telemedicine can serve as a complementary strategy to traditional podiatric consultations by facilitating the timely identification of patients who may require urgent interventions. The integration of telemedicine into podiatry practice has the potential to provide additional benefits to current services and improve patient autonomy. However, the potential advantages of podiatric telemedicine can only be realized if the known constraints are recognized and addressed beforehand. Further work is being undertaken by the authors to establish evidence-based telemedicine guidelines for foot and ankle management in a primary care setting. Once established these will be piloted for further evaluation and implementation.

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