Implementation, effectiveness and monitoring of telemedicine program in Bhutanese refugees camp in Eastern Nepal

Pramendra Prasad Gupta¹, Salina Khatoon², Neemesh Khatiwada³, Abishekh Mishra³, Narendra Bhatta⁴, Antoine Geissbuhler⁵

¹Associate Professor, Department of General Practice and Emergency Medicine, Medical Coordinator, eHealth and Telemedicine Program, B.P. Koirala Institute of Health Sciences, ²Health Associates, UNHCR, Damak, ³Medical Officers, AMDA, Damak, ⁴Prof. and Chair, Department of Pulmonology, Critical Care and Sleep Medicine, and Focal Person in eHealth and Telemedicine Program, B.P. Koirala Institute of Health Sciences, ⁵Prof. and Director, Department of Medical Informatics, University of Geneva, Switzerland

Abstract

Background: Telemedicine, a part of Medical Informatics used to consult patients from remote places either via videoconferencing or transferring data and resources via the Store and Forward method, makes the quality of healthcare in low-and middle-income countries more efficient, cost-effective, and accessible. The objectives of this study were to determine its effects on the health of refugees and its efficacy in terms of referrals and cost reduction for healthcare service providers among Bhutanese refugees in eastern Nepal. **Methods:** This was a cross-sectional study done retrospectively from the records of patient data of Bhutanese refugees from AMDA, Damak, and prospectively by asking the questionnaire to the healthcare providers of Beldangi PHC of AMDA, Damak. **Results:** The total percentage of patients that were seen via teleconsultation in the primary center was 58% male and 42% females, whereas from the secondary center, males were 43% and females constituted 57%. The referral rate from those primary centers and secondary centers were decreased to 31% and 39%, respectively, from 72% and 61% from previous records. The budget expenditure was also decreased to 13.65% from 29.41%. **Conclusions:** Telemedicine is beneficial in those types of refugee camps where there are chains of referring patients from primary health centers to tertiary care centers via secondary healthcare centers. As it not only decreased the referral rate but also save the budget expenditure, which are needed when referring those patients to other centers.

Keywords: Bhutanese refugee camp, referral rate, telemedicine

Introduction

Out of the global population, there are 26 million refugees who are forcibly displaced from their countries. United Nations High Commissioner for Refugees (UNCHR) is the primary agency involved in assisting and referring the most vulnerable refugees to

be transferred to another country if the host country is unsafe.[1] The health of resettled refugees has become a significant public health concern, as refugees often face hardship before and after the resettlement process, which is likely to have a significant impact on their community's health status.[2,3]

Telemedicine is one of the important parts of Medical Informatics, which makes the provision of quality healthcare in low- and middle-income countries more cost-effective, efficient, and accessible using information and communication

Address for correspondence: Dr. Pramendra Prasad Gupta, Department of General Practice and Emergency Medicine, B. P. Koirala Institute of Health Sciences, Dharan, Nepal. E-mail: dr.pramen@gmail.com

Access this article online
Quick Response Code:
Website: www.jfmpc.com
DOI: 10.4103/jfmpc.jfmpc_1801_21

technologies that serve patients and empower the health workers.[4]

There are very limited data analyzing health experiences. Despite the multitude of burdens resettled refugees face, there is limited research analyzing health experiences and the impact of their experiences within the healthcare system.[5] With the help of telemedicine, medical professionals ranging from primary care doctors to other healthcare professionals involved in managing the health conditions of those refugees are able to treat the refugees remotely and play a major role in implementing better healthcare with this innovative technology.

Due to the third-country resettlement program, the numbers of refugees living in the camps are declining, and at the same time, limited financial resources due to refugees' crises throughout the world make the UNHCR think of a creative way to manage the health needs of the refugees in a sustainable manner.[2]

The main objective of the study is to highlight how the patient at distance can be benefitted from medical experts through the introduction of technology in the medical treatment process and to determine its effects on the health of refugees and its efficacy in terms of referrals and cost reduction for healthcare service providers.

Materials and Methods

UNHCR brought out this innovative technology and support for the implementation of this technology through its NGO partner called Association of Medical Doctors for Asia (AMDA) in collaboration with B. P. Koirala Institute of Health Sciences, Ghopa, Dharan. This is a cross-sectional study done retrospectively using the records of patients of Bhutanese refugees from AMDA, Damak, and prospectively by asking the questionnaire to the healthcare providers of Beldangi PHC of AMDA, Damak.

All refugee patients who were seen in Beldangi I PHC via teleconsultation during the study period and the healthcare professionals involved in this process were included in this study. The total number of patients enrolled in Beldangi camp 1 one year before and after teleconsultation started were taken from the records. The cost analysis was also taken from the records of UNHCR. The service providers were assessed by the questionnaire for the evaluation and its effectiveness and satisfaction prospectively.

The data regarding the patients, their referral, and the cost were entered in the Microsoft Excel sheet before (Jan to Dec 2015) and after (Jan to Dec 2016) teleconsultation. The effect of this program was assessed by the questionnaire to the healthcare providers who were consulted via telemedicine. The parameters assessed were age, sex, diagnosis, referrals, if referred then where, cost on referrals, views of service providers.

Data analysis was done using a datasheet created in Statistical Package for Social Sciences (SPSS) and qualitative data were analyzed through domain analysis. Verbal informed consent was taken from each research participant before data collection following the ethical norms and values as stated in the National Ethical Guidelines for Health Research in Nepal, 2001. Ethical Clearance was taken from the Institutional Review Committee (IRC) of BPKIHS on 25th July 2017.

Results

There was a primary center from where the patients were consulted and referred to secondary centers. Next, from secondary centers, the patients were referred to tertiary centers. In the primary center, the total number of patients consulted was 603, whereas 126 patients were consulted from secondary and tertiary care centers (B. P. Koirala Institute of Health Sciences, the nodal center). The demographic profile is shown in Table 1.

The top 10 diseases found from all primary and secondary centers are shown in Table 2.

The referral rate of patients before and after implementation is shown in Table 3.

The budget expenditure with costs referring the patients to different referred centers before and after implementation of the telemedicine program is shown in Figure 1.
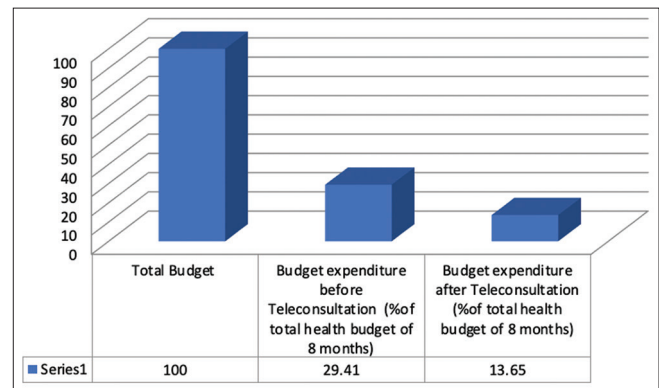

Figure 1: Table 4: Budget expenditure comparison

Table 1: Demographic profile		
	Primary center (*n*=603) %	Secondary center (*n*=126) %
Sex distribution		
Male	58	43
Female	42	57
Age-wise distribution		
<15 years	12	09
16-30 years	21	26
31-45 years	39	35
>45 years	28	30
Education		
Literate	42	32
Illiterate	58	68

Figure 1 shows the budget expenditure with cost when referring the patients to different referred centers.

At the end of the research, healthcare providers were asked about the use and benefits of the program, which are shown in Table 4.

Table 4 shows the viewpoint of healthcare providers who used this teleconsultation for consulting patients during their respective duties.

Discussion

This research shows the efficacy of teleconsultation in a Bhutanese Refugee Camp in Damak, the eastern part of Nepal where they were having a primary care center and patients were referred from there to secondary and tertiary care centers. After starting teleconsultation among primary and secondary centers and tertiary centers, the referral rate and the budget expenditure decreased.

This is the first research done on telemedicine in a Bhutanese Refugees Camp, which is managed by the UNHCR. In this research, we found that the maximum number of males consulted from primary healthcare centers to the secondary centers and the maximum number of females consulted with the tertiary care centers. Among the age groups, the maximum number of patients was among age groups of 31 to 45 years. The reasons that the participants revealed for consulting a healthcare provider included specialized and good quality care, which they felt they

could get from a teleconsultation without wasting their time and effort. Even AMDA do not have to spend the money which costs them for the treatment of the referred patients when they used to refer to tertiary centers before initiation of Telemedicine. Easy access was another important factor that may lead them to seek treatment from a healthcare provider.

The disease conditions that most of the patients presented were respiratory conditions, followed by dermatological and gastrointestinal problems. As shown by many researchers that due to excessive smoking and bad housing conditions and the nature of work, most of the people in rural areas suffer from respiratory conditions. These results were the same as compared to the research done by Ahmad *et al.*[6] on a refugee's camp in Kenya and concluded that refugee camps may host large numbers of people in a confined area; these people are especially prone to infectious diseases and are at a high risk of developing acute respiratory infections (ARIs) due to overcrowding, inadequate food and shelter, and malnutrition.[7]

The overall referral rate from primary and from secondary centers decreased effectively after starting teleconsultation in the Bhutanese refugee camp and this was due to the facts that the primary center being run by the paramedical staffs and secondary center run by the undergraduates without proper specialized training, which needs to treat most of the difficult cases in outpatient department (OPD). Another reason was that all those cases that were referred were OPD-based cases, which can be treated in the same center with the help of specialists via teleconsultation. Teleconsultation can be used to provide advanced care until the patient is under a physician's care; moreover, it can be used to support the paramedics who work alone to provide treatment in non-life-threatening cases.[6,8]

The budget expenditure on the health of these Bhutanese refugees decreased substantially from the previous years and it was due to the decreased referrals than before. As the referrals from both the centers decreased significantly to 31% and there was a saving of 59% from the previous referral rates from the primary centers and 39% with a saving of 22% from the previous years from secondary centers, the budget expenditure also decreased from 29.41 to 13.65%.

With the use of telemedicine, not only the patients were benefitted but also the healthcare providers who worked in these

Table 2: Distribution of diagnosis according to the primary and secondary centers

Disease	Primary centers (*n*=603) %	Secondary centers (*n*=126) %
Respiratory disease	26	28
GI problems	15	16
Dermatological problems	12	18
Cardiovascular	11	9
Renal problems	10	9
Diabetes	8	7
Hypertension	7	6
Gynecological problems	7	6
Others	4	1

Table 3: Referrals rate comparison

	Referred percentage before teleconsultation	Referred percentage after teleconsultation	Benefits of teleconsultation (%)
Primary referrals	72	31	59
Tertiary referrals	61	39	22
Medical referral at night	26.9	9.1	17.8
Medical referral at day	22.8	8.6	14.2
Medical referral among total General consultation in outpatient department	6.4	4.4	2.0

Primary referral means referral from camp health post to primary center

Tertiary referral means referral from the primary level or health post to tertiary hospitals.

Table 4: From healthcare providers' points of view

Particulars	Percentage (*n*=19)
Easy to handle	87
Helps in improving knowledge	94
Helps in improving skills	91
Needs more training in handling	73
Difficulties in handling even after training	48
Disturbing the traditional methods	19
Satisfaction on using	96
Satisfaction from patients perspective	91
Wants to continue	96

areas as their confidence increased in treating such cases, their knowledge was updated, their clinical skills improved, and their experience also increased. The reason behind it was that they directly received consultation from specialists who had experience in treating these disease conditions.

The satisfaction among the healthcare professionals also increased and the reason for this could be that they were able to see specialists related to the patient's condition, and the ability to communicate with the provider in a very personal and intimate manner, thanks to telecommunication technologies.[9,10]

The major long-term benefit of this program was to connect the refugee camp's health clinic to the government's services. When the resettlement process comes to an end, healthcare delivery in the camps could perhaps be taken over by the government, in which case the transition would be facilitated by existing linkages.[7]

The limitation is that this research was done in only one refugee camp. Such studies should be done in various refugees camps in different places that can show effective results.

Conclusions

Telemedicine is beneficial in those types of refugee camps where there are chains of referring patients from primary health centers to tertiary care centers via secondary healthcare centers. As it not only decreases the referral rate but also saves the budget expenditure, which is needed when referring these patients to other centers.

Thus, this research recommends continuing the program and improving it among the service providers and donor agencies for further policies and planning.

Conflicts of interest

There are no conflicts of interest.

References

1. United Nations High Commissioner for Refugees [UNHCR] UNCHR; 2018. Global Trends Forced Displacement in 2018. Available from: https://www.unhcr.org/en-us/statistics/unhcrstats/5d08d7ee7/unhcr-global-trends-2018.html. [Last accessed on 2021 Oct 10].

2. Wachter K, Heffron LC, Snyder S. Unsettled integration: Pre-and post-migration factors in Congolese refugee women's resettlement experiences in the United States. Int Soc Work 2016;59:875-89.

3. Salinas M, Matarrita-Cascante D, Salinas JL, Burdine JN. Navigating healthcare systems before and after resettlement: Exploring experiences and recommendations for improvement from the perspectives of a Bhutanese refugee community. J Migr Health 2021;4:100049. doi: 10.1016/j.jmh. 2021.100049.

4. Fabbrocini G, De Vita V, Pastore F, D'Arco V, Mazzella C, Annunziata MC, *et al.* Teledermatology: From prevention to diagnosis of Nonmelanoma and Melanoma skin cancer. Int J Telemed Appl 2011;1-5. doi: 10.1155/2011/125762.

5. Matlin SA, Depoux A, Schütte S. Migrants' and refugees' health: Towards an agenda of solutions. Public Health Rev 2018;39:27. doi: 10.1186/s40985-018-0104-9.

6. Ahmed JA, Katz MA, Auko E, Njenga MK, Weinberg M, Kapella BK, *et al.* Epidemiology of respiratory viral infections in two long-term refugee camps in Kenya, 2007–2010. BMC Infect Dis 2012;12:7. doi: 10.1186/1471-2334-12-7.

7. UNHCR Innovations 2015, using telecommunications to improve clinical health care in refugees'camp. Available from: http://innovation.unhcr.org/using-telecomms-to-improve-clinical-healthcare-in-refugee-camps/. [Last accessed on 2021 Oct 01].

8. Zundel KM. Telemedicine: History, applications, and impact on librarianship. Bull Med Libr Assoc 1996;84:71-9.

9. Freiburger G, Holcomb M, Piper D. The STARPAHC collection: part of an archive of the history of telemedicine. J Telemed Telecare 2007;13:221-3.

10. Gustke S, Balch DC, West VL, Rogers LO. Patient satisfaction with telemedicine. Telemed J 2004;6:5-13.