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RESEARCH ARTICLE

INDIAN PRIMARY CARE PROVIDERS' EXPERIENCES OF EMPOWERMENT IN MENTAL HEALTH NURSING THROUGH TELEMEDICINE

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ABSTRACT

Background: Telemedicine is an emerging health care technology in India. The success and utilization of any new technology depends on several contributing factors such as knowledge, awareness of the concept, competencies, and attitude towards technology by the concerned health care professionals. ***Objectives:*** The main aim of this study was to assess the knowledge, attitude, skills as well as perceived advantages and barriers of telemedicine among the primary care providers working in District Mental Health Program (DMHP), Karnataka, India. ***Methodology:*** A cross sectional study was conducted among nurses working in DMHP who participated in an onsite training program at NIMHANS. A pre-validated, self-administered questionnaire of Nurses Experience with Empowerment through Telemedicine (NEET) was used to assess the knowledge, attitude and skills of the nurses after attending 16 monthly telemedicine sessions. Open ended questions were used to explore their perception about the advantages and barriers towards telemedicine. ***Results:*** Majority of the subjects gained adequate knowledge (93%) through telemedicine session, had positive attitude (97.67%) towards telemedicine and confidence (93%) in identifying, managing and referring the patients with mental illness. Content analysis revealed that gaining knowledge, identification of mental illness and its management were the most common positive experiences while technical disturbances or internet problem and time constraint were some barriers perceived by the nurses. ***Conclusion:*** Nurses working in remote areas can be equipped and educated through telemedicine to make strong contribution to nursing and health services. Thus, empowering nurses through telemedicine can become a powerful strategy to bridge the treatment gap for mental health issues in a developing country like India.

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INTRODUCTION

The use of information technology constitutes an integral component of human's life in banking, education and particularly in health care settings. Advanced development of technology has had a significant impact on quality of health care services especially in rural areas where access to health care services is difficult for the consumers. Dramatic changes in health care scenario reflected by increasing patients with mental health problems and manpower shortages has made it necessary for nurse to embrace telemedicine (Rutledge *et al.,* 2017). Tele-health or telemedicine is a real-time, audio-video communication tool that connects providers and patients in different locations (Balestra, 2018). It also offers a new method of providing healthcare services across different geographical areas to provide the accessibility of healthcare services to people who do not have access to such services in their residential areas (Ayatollahi, Sarabi and Langarizadeh, 2015). The World Health Assembly considered fostering the use of science and technology for health as one of the essential functions of sustainable health systems (World Health Organization, 2010). The concept of E-health has emerged in the early 21st century which includes both electronic information and communication technology in the health sector. This technology is used for multiple purposes such as clinical, educational, research, administration etc. (Cashen, Dykes and Gerber, 2004). The important goal of telemedicine services is to bridge the gap between high demands and limited access to health care in rural and urban areas. In brief, the purposes are to increase efficiency in health care, improve quality of care, increase commitment to evidence-based practices, empower the clients, and develop new relationships between patients and health professionals (Alkhatlan,

Almutairi and El-Shazly, 2016). Nursing professionals play an important and essential role in providing quality health care services through the development and implementation of telemedicine initiatives. Therefore, nurse leaders and administrators must understand the technical characteristics of health information technology as well as the clinical capabilities of telemedicine within the health care system (Harrison, Nolin and Suero, 2004; Ramsey, Ormsby and Marsh, 2001). In India, nurses under the District Mental Health Program (DMHP) provide the mental health services to the rural and disadvantaged populations. It is important for primary health care providers to have sufficient knowledge and skills in the use and application of telemedicine technologies in nursing practice to provide appropriate care. It also helps in early identification, screening and referral of patients with mental health problems. This sensitization happens at its best when on-site training is followed by hand-holding through telemedicine. An intensive literature search found very little information about perception of telemedicine by health care professionals particularly nurses in India, who are providing mental health services. The aim of this study was to assess the knowledge, attitude and skill among nurses working under DMHP of telemedicine and perceived advantages and barriers regarding its utility in future practice.

MATERIALS AND METHODS

It was a cross sectional study conducted among nurses working under DMHP who participated in a refresher program conducted at NIMHANS in the year 2019.

Sample: The nurses (n=60) who were working in the District Mental Health Program were invited from various districts, to undergo an initial onsite training program on *sensitization of mental health* nursing conducted at NIMHANS, Bangalore in the year 2017. Handholding was done through monthly telemedicine session for 16 months held on third Wednesdays following which the group was invited for a follow-up workshop in the year 2019. Thus, 51 staff had enrolled for the workshop and in the study as well. Out of the completed questionnaires, 8 nurses had never attended any telemedicine session, hence those were not analysed for assessing knowledge, attitude and skill, but were considered for qualitative analysis to explore their perceived advantages and barriers to participating in the telemedicine session.

The selection criteria:

Inclusion criteria

- Nurses working in Karnataka DMHP services.
- Nurses who attended the onsite training program.
- Nurses who attended the telemedicine sessions.

Exclusion criteria

- Subjects who did not attend the workshop.

Tools for Data collection: Nurses' Experience with Empowerment through Telemedicine (NEET) questionnaire is a pre-validated self-administered questionnaire which was used to assess the knowledge and attitude towards telemedicine as well as skills acquired through attending telemedicine sessions. Content validity was done and test-retest reliability revealed that the scale was reliable, with significant strong correlation for overall score (r = 0.83).

The instrument consists of three parts:

a) *Socio-demographic data sheet:* The demographic form comprised of 6 items to obtain the background information of the subjects in the study that included; age, sex, designation, professional experience, number of telemedicine sessions attended, number of cases identified.
b) *Nurses Experience with Empowerment through Telemedicine (NEET) Questionnaire:* It consisted of 18 items on a five point Likert rating scale, and the responses were Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. It has three domains: Perceived improvement of knowledge through telemedicine session (6 items), attitude towards attending telemedicine sessions (7 items) and skill on identifying and managing patients (5 items). The score ranges from 18-90. Increasing scores reflect higher knowledge and positive attitude towards telemedicine. Domain wise, score higher than 15 was considered to be good or adequate knowledge, score more than 17 indicated positive attitude and score higher than 13 was considered to have good skill.
c) *Perceived advantages and barriers:* It consists of three open ended questions to explore the perception of advantages and barriers in utilization of telemedicine services.

Data collection Procedure: Data were collected from nurses before commencement of the refresher program at NIMHANS. On introduction, the author explained briefly about aim and objectives of the study. The subjects were assured of confidentiality and anonymity. Subjects who were willing to participate were asked to complete the questionnaires. It took around 20-30 minutes to complete the questionnaires.

Ethical considerations: The research proposal was reviewed and approved by the Institute Ethics Committee. Written informed consent was obtained from all the subjects and they were given freedom to withdraw from the study at any time. Confidentiality of the subjects were assured as the data collection tools did not include any personal identifying information (such as name, address, mobile number, etc.).

Data analysis

The quantitative data were checked and analysed by using SPSS version 22. The negatively worded items (attitude subscale) were reverse coded before the analysis. Descriptive statistics such as mean, median, frequency and percentages were calculated to explain the demographic profile of the respondents. Since the data did not follow normal distribution, non-parametric test such as Mann Whitney U was performed to compare the knowledge, attitude and skills about telemedicine between the socio-demographic variables. Spearman (rho) correlation was calculated to assess the correlation between the study variables. P value of <0.05 was considered to be statistically significant.

RESULTS

Socio-demographic characteristics of study subjects: Mean age of the subjects was 30.62±4.48 and majority of them were females (72.1%). The subjects were working as psychiatric nurses (48.8%), and community mental health nurses (51.2%).

Years of working experience of the nurses had a median of 26 months (24-30 months), and they had attended 2- 16 telemedicine sessions. The Socio demographic characteristics of the subjects are presented in Table 1.

Knowledge, attitude and skill among the subjects: Among the total of 43 professionals, knowledge score of 24 (23, 26) indicates that they have gained adequate knowledge through telemedicine session, the attitude score of 21 (22, 26) shows that respondents had positive attitude towards telemedicine session and score of 21 (19, 22) in the skill domain shows that the subjects had confidence in identifying, managing and referring the patients with mental illness. Around 93% subjects had adequate knowledge, 97.67% had positive attitude and 93% had good skill for identification and managing patients with mental health problems.

Correlation between knowledge, attitude and skill domains: Knowledge was found to be significantly correlated with attitude and skill indicating that the subjects who had higher knowledge, had positive attitude towards telemedicine and strengthened their skill in identifying and managing patients through telemedicine sessions (Table 2).

Table.1. Socio-demographic characteristics of study subjects (n=43)

Variables		Frequency	Percentage
Sex	Male	12	27.9
	Female	31	72.1
Designation	Psychiatric Nurse	21	48.8
	Community Mental Health Nurse	22	51.2
Variables		**Median**	**Quartile range**
Professional experience (in months)		26	24, 30
No of TM sessions attended		10	5, 13
No of cases identified		200	59, 400
No of cases referred		50	3, 156

Table 2. Correlation between Knowledge, attitude and skill domains

Variables		Knowledge	Attitude	Skill
Knowledge	Spearman Correlation (ρ)	.	**.450****	**.711****
	p-value		.002	<.001
Attitude	Spearman Correlation (ρ)			.204
	p-value			.190

*Significant at p <0.05, **Significant at p <0.01

Table 3. Association of the knowledge, attitude and skill with socio-demographic variables (n=43)

Variable	Designation Median (Q1, Q3)		U-value	p-value
	Psychiatry (n=21)	Community (n=22)		
Knowledge	24 (22, 25.5)	25 (24, 26.25)	163	0.094
Attitude	23 (20.5, 25.5)	23 (22, 26)	223.5	0.854
Skill	20 (17.5, 21)	21.5 (20, 22.5)	163	0.096
Total	67 (61, 73.5)	68.5 (65.75, 76)	180	0.214
Variable	**Gender**		**U-value**	**p-value**
	Male (n=21)	**Female (n=22)**		
Knowledge	24.5 (23.25, 28.25)	24 (23, 26)	163	0.528
Attitude	24 (22.25, 26)	23 (20, 24)	140	0.214
Skill	20.5 (19.25, 24.75)	21 (19, 22)	152	0.353
Total	69 (66, 79)	67 (64, 72)	141	0.227

Association of the knowledge, attitude and skill with socio-demographic variables: Table 3 describes the association between the knowledge, attitude and skill with specific demographic variables such as designation and gender. No statistically significant association was found between the variables.

Perceived advantages and barriers of attending telemedicine sessions: Content analysis of the open-ended questions posited three major categories: positive experiences, negative experiences and the ways to improve. These are presented with frequency and percentage in Table 4.1, 4.2 and 4.3 respectively.

Table 4. Responses of participants towards perceived advantages and barriers

Table 4.1. Positive experience

Sl. no.	Statement	Frequency (%)
1.	Improved knowledge	20 (10.2)
2.	Identification of mental illness & management	19 (9.69)
3.	Gaining good experience	6 (3.06)
4.	Discuss the problem faced in community	3 (1.53)
5.	Clarifying doubts	2 (1.02)
6.	Helpful to know about drugs & side effects	1 (0.51)
7.	Better communication during home visit	1 (0.51)
8.	No need to travel: time & energy saving	1 (0.51)
9.	Became aware of telemedicine	1 (0.51)

Table 4.2. Negative experience

Sl no.	Statement	Frequency (%)
1.	Technical Disturbance/ internet problem	27 (13.77)
2.	Time constraints due to home visit/ traveling	10 (5.1)
3.	Not incorporating practical experience	7 (3.57)
4.	Wednesday is a busy day for us	4 (2.04)
5.	Noise during session	1 (0.51)

Table 4.3. Ways to improve

Sl no.	Statement	Frequency (%)
1.	Increase duration of session and frequency	13 (6.63)
2.	More practical exposure	9 (4.59)
3.	Solution for technological problems	5 (2.55)
4.	Conduct training program at NIMHANS	3 (1.53)
5.	Management of patient with complex problems	2 (1.02)
6.	Case presentation with real patient	2 (1.02)
7.	Nothing, already doing good	2 (1.02)

DISCUSSION

The use of telemedicine technology in health care system offers many benefits to healthcare professionals by increased productivity, reducing travel time, proper patient care services on time. In fact, to make this technology more user-friendly, the nurses should have good knowledge and positive attitude toward this new technology. In the present study, results showed that nurses have adequate knowledge and positive attitude towards the telemedicine sessions. The findings are similar to the study conducted among health professionals working in teaching hospitals which showed that the subjects had adequate knowledge (88%) about telemedicine (Zayapragassarazan and Kumar, 2016). These results are also similar to the findings by Gatit *et al.,* (2008) which showed that 39 percent had a high level of knowledge and 48.8 percent had good knowledge of telemedicine and only 12.2 percent of physicians had limited knowledge about telemedicine. In contrast to our study, the study by Sheikhtaheri, Sarbaz, Kimiafar, Ghayour and Rahmani (2016) in selected teaching hospitals showed that health professionals had low knowledge about telemedicine with total awareness of health professionals with 13 ± 5.5 out of 35, which signified as low, but most of them had positive attitude toward telemedicine with total score of 63.42 ± 9.5 indicating a positive attitude that is almost similar with the present study results. Similar to our present study findings, that around 83% of the nurses had used telemedicine, a study from north India also reported that 60.13% of the doctors had used telemedicine (Meher, Tyagi and Chaudhry, 2009). The higher percentage may be attributed to the fact that in the current study, the subjects were

encouraged to attend telemedicine sessions following an onsite training programme. This reiterates the fact that if proper scope is provided, the health professionals are more likely to use telemedicine. This study highlights significant correlation between knowledge, attitude and skill which may increase confidence in identifying and managing patients with mental health problems. Another study (Shittu *et al.,* 2007) also documented that willingness to use tele-health services among health care professionals were knowledge of tele-health applications (28.1%); perception of tele-health benefits (14.1%) and reduced barriers to tele-health care. A study was conducted among 143 doctors at 14 different hospitals in India, and from 121 patients where most doctors felt that telemedicine was important. One hundred of the 121 patients were not aware of telemedicine. However, when the concept was explained, most patients had a positive attitude towards telemedicine (Meher *et al.,* 2009). In the present study, the quantitative finding that majority of the subjects had adequate knowledge have been supported by qualitative findings too. Gaining knowledge and identification of mental illness and its management were most common positive experiences while technical disturbance or internet problem and time constraint were some barriers perceived by the nurses. The nurses felt that increased duration of session and frequency and more practical exposure would help them to gain more experience through telemedicine sessions. Content analysis of responses to open-ended questions of another study (Zayapragassarazan and Kumar, 2016) also revealed that lack of organizing skills, technical skills including computing and management skills were some of the perceived barriers. The study also showed that physicians' perception of telemedicine was a major factor that influenced the development of telemedicine programs (Gatit *et al.,* 2008).

Strength and limitations: The current study has several strengths. Firstly, it is the first study to explore the knowledge and skill acquired through telemedicine sessions as well as attitude towards the same among the nursing primary care providers in India. Secondly, the sample comprises of 51 staff out of total 60 DMHP nurses in the state of Karnataka which can be a representation of a Southern state of India. Lastly, inclusion of open-ended questions which helps to document their voices regarding the perceived advantages, barriers and the ways to improve the telemedicine experience. The present study also has certain limitations such as cross sectional descriptive research design and use of self-administered questionnaire. Hence, social desirability bias also could not be eliminated.

Conclusion

Telemedicine in health care has changed the health care services in India. Nurses working in remote areas and distant places should be equipped and educated in telemedicine to make strong contributions to nursing and health services. It is also essential for nurses working in mental health services to become empowered with telemedicine knowledge and hands-on skills, so that they can be strong workforce within nursing practice and health care systems. Thus, empowering nurses through telemedicine can become a powerful strategy to bridge the treatment gap for mental health issues in a developing country like India.

Abbreviations

DMHP: District Mental Health Programme

NEET: Nurses' Experience with Empowerment through Telemedicine

SPSS: Statistical Package for Social Sciences

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