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Effectiveness of 'Structured Teaching Programme' (STP) on telemedicine among rural population

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Abstract
The state of Maharashtra has good health infrastructure but, geographical area wise it is not able to satisfy the need of advanced medical care to peoples who are residing in hilly areas of Maharashtra or even in entire country.
One of the greatest challenges which are faced by the Maharashtra healthcare system is to provide quality care to the large segment of the population, which does not have access to specialty physicians because of factors such as geographic limitations or socioeconomic conditions.
Methods: Used for the study is evaluative approach with pre and post test control group design. Study was conducted on 100 subjects from Kole, Karad by using Simple Random Sampling Technique with randomly allocation of groups.
Result: It was observed that overall Mean Knowledge regarding Telemedicine among the subjects was (52%) had good knowledge and (15%) had excellent knowledge. It was evident that maximum number of subjects had good knowledge regarding Telemedicine. Calculated chi-squared test value shows there is association between the socio demographic variables of subject and level of knowledge regarding Telemedicine among people residing rural area of Karad at $p<0.05$ level of significance.
Conclusion: The STP was useful to the subjects to increase knowledge regarding Telemedicine.

Keywords: assess, effectiveness, structured teaching programme, telemedicine, rural population

Introduction
One of the greatest challenges which are faced by the Maharashtra healthcare system is to provide quality care to the large segment of the population, which does not have access to specialty physicians because of factors such as geographic limitations or socioeconomic conditions. The use of technology to deliver health care from a distance, or telemedicine, has been demonstrated as an effective way of overcoming certain barriers to care, particularly for communities located in rural and remote areas. In addition, telemedicine can ease the gaps in providing crucial care for those who are underserved, principally because of a shortage of sub-specialty provider [1].
Information and communication technologies (ICTs) have great potential to address some of the challenges faced by both developed and developing countries in providing accessible, cost-effective, high-quality health care services. Telemedicine uses ICTs to overcome geographical barriers, and increase access to health care services. This is particularly beneficial for rural and underserved communities in developing countries – groups that traditionally suffer from lack of access to health care.
The importance of evaluation within the field of telemedicine cannot be overstated: the field is in its infancy and while its promise is great, evaluation can ensure maximization of benefit. ICTs can be costly, as can be the programmes using them to improve health outcomes. Indeed, the most frequently cited barrier to the implementation of telemedicine solutions globally is the perception that the cost of telemedicine is too high. Closely linked with cost is cost-effectiveness. Almost 70% of countries indicated the need for more information on the cost and cost-effectiveness of telemedicine solutions, and over 50% wanted more information on the infrastructure necessary to implement telemedicine solutions. Wanting additional information on the clinical uses of telemedicine was cited by almost 60% of countries; it was one of the three most requested areas of information by Member States. While developing countries are more likely to consider resource issues such as high costs,

Underdeveloped infrastructure, and lack of technical expertise to be barriers to telemedicine, developed countries are more likely to consider legal issues surrounding patient privacy and confidentiality, competing health system priorities, and a perceived lack of demand to be barriers to telemedicine implementation. Telemedicine progress can be better measured when legal frameworks are introduced, national eHealth policies are developed, more human resources are trained, regular funding is committed, and long-term plans are made [2].

The state of Maharashtra has an area of 307, 713 sq. km. and a population of 96.88 million. There are 37 districts, 358 blocks and 43711 villages. The State has population density of 314 per sq. km. (as against the national average of 312). The decadal growth rate of the state is 22.73% (against 21.54% for the country) and the population of the state continues to grow at a much faster rate than the national rate [3].

Clinical telemedicine may be as simple as the health professionals discussing a case over the telephone, or as complex as using satellite technology and video conferencing equipment to conduct a real time consultation between medical specialists in two different countries. Telemedicine generally refers to the use of communications and information technologies for the delivery of care. Care at distance (also called in absentia care), is an old practice which was often conducted via post. There has been a long and successful history of in absentia health care which, thanks to modern communication technology, has evolved into what we know as modern medicine. In its early manifestations, African villagers used smoke signals - 3 - to warn people to stay away from the village in case of serious disease. In the early 1900s, people living in remote areas in Australia used two way radios powered by a dynamo to communicate with a royal flying doctors of Australia [4].

A recent survey by the Indian medical society has found 75% of qualified consulting doctor's practice in urban centres and 23% in semi urban areas and only 2% from rural areas where as majority of the patient's come from rural areas. Hospital bed/1000 people are 0.19in rural and 2. 2 in urban areas [5].

I n a developing country such as India, there is huge inequality in health-care distribution. Although nearly 75% of Indians live in rural villages, more than 75% of Indian doctors are based in cities [6]. Most of the 620 million rural Indians lack access to basic health care facilities [7]. The Indian government spends just 0.9% of the country's annual gross domestic product on health, and little of this spending reaches remote rural areas [8]. The poor infrastructure of rural health centers makes it impossible to retain doctors in villages, who feel that they become professionally isolated and outdated if stationed in remote areas. In addition, poor Indian villagers spend most of their out-of-pocket health expenses on travel to the specialty hospitals in the city and for staying in the city along with their escorts [69]. A recent study conducted by the Indian Institute of Public Opinion found that 89% of rural Indian patients have to travel about 8 km to access basic medical treatment, and the rest have to travel even farther [10].

Aims: To improve the knowledge regarding Telemedicine among rural population.

Objective of the study

1) To assess the knowledge on telemedicine among the rural population.
2) To assess the effectiveness of Structured Teaching Programme on telemedicine among the rural population.
3) To find out association between selected socio demographic Variables such as age, gender, education, occupation, religion, and place of living.

Methods

The study conducted with evaluative approach with pre and post test control group design. Study was conducted on 100 subjects from Kole, Karad by using Simple Random Sampling Technique with randomly allocation of groups. The setting for the present study conducted was in rural area, Kole, Karad. The population consists of all rural population in Kole, Karad. The sample size decided for the study was 100.

Procedure for data collection

Formal permission to conduct the study was obtained from the Principal, K.I.N.S. Karad as well as Primary Health Officer, Kole, Karad & Taluka Health Officer, Karad. Then subsequently, the tool was administered to the rural population.

A time scheduled was planned for collecting the data. In order to obtained free and frank response each participant was taken into confidence and assured about confidentiality of their responses. The average time taken for each data collection was approximately 30 minutes. The study followed a one group pre test, post test quasi experimental design.

The data obtained was analyzed in terms of the objectives of the study using descriptive and inferential statistics.

The plan of data analyses was as

a) Tabulation of data in terms of frequency, percentage, mean, SD, median & range and □2 test.

b) Classifying knowledge score using mean & SD as follows –

X + SD poor score

X - SD to X + SD good score

X - SD excellent score.

Independent variables

In this study, independent variable refers to the Structured Teaching Programme (STP).

Dependent variables

In this study, dependent variable refers to the knowledge on Telemedicine among peoples in Karad taluka.

Hypothesis

H1: There will be a significant difference between pre-test and post-test knowledge level of the sample regarding Telemedicine.

H2: There will be a significant association between pre-test and post-test level of knowledge score of sample regarding Telemedicine.

Results

Section-I: Description of demographic variables

The most of 38 (38%) respondent of people residing rural area of Karad Taluka were in the age group of 41-50 years followed by 31(31%) who were in the age group of 31-40 years and 21 (21%) respondents of people residing rural area of Karad Taluka were 51-60 years of age and 7 (7%) were <30 years of age and 3 (3%) were >60years of age. Were

most of 65 (65%) respondent of people residingrural area of Karad Taluka were males and the remaining 35 (35%).
Respondents of people residing rural area of Karad Taluka were females. The most of 38 (38%) respondent residing in rural area of Karad Taluka were illiterate, 29 (29%) had completed primary education, 26 (26%) had secondary education and 3 (3%) respondents had completed.
Intermediate or post higher secondary education. And were graduates each. Only 1 (1%) had completed professional education. 86 (86%) of people residing rural area of Karad Taluka were Hindus and 14 (14%) Muslims. Majority of people residing rural area of Karad Taluka were Clerical, shop owner of farmer i.e. 36 (36%). skilled workers Then, 25 (25%) were semi profession, 22 (22%) were skilled workers, 13 (13%) were unskilled workers. 3 (3%) were semiskilled workers. Whereas only 1 (1%) was professional. 49 (49%) monthly income was between
Rs. 11, 451 - Rs. 17, 150. 22 (22%) respondents family income was between Rs. 6, 851 - Rs. 11,450. 19 (19%) respondent had income between Rs. 17, 151 - Rs. 22,850. 8 (8%) respondent had income
Between Rs. 22, 851 - Rs. 45, 750. 2 (2%) respondents family income was more than Rs. 45, 751/-. Were 58 (58%) of live in joint family and 31 (31%) from nuclear family. And 11 (11%) live in extended family. The majority of people residing rural area of Karad Taluka i.e. 49 (49%) gained knowledge about Telemedicine from newspaper followed by 31 (31%) people gained knowledge from television. Knowledge gained from health workers 15 (15%), only 5 (5%) got information through radio.

Section-II

Table 1: Classifications of people residing in rural area of Karad Taluka on pre- test knowledge level Score regarding Telemedicine

Level of knowledge No.	Score		Level of Respondents %
Poor	1-9	39	39.0
Good	10-18	49	49.0
Excellent	19-25	12	12.0
Total	100		100.0

N=100

Majority 49.0 % of the subjects had Good knowledge, 39.0 % had poor knowledge, 12.0 % subjects excellent knowledge regarding Telemedicine.

Table 2: Classification of people residing rural area of Karad Taluka on post test knowledge level Score regarding Telemedicine

Level of knowledge No.	Score		Level of Respondents %
Poor	1-9	33	33.0
Good	10-18	52	52.0
Excellent	19-25	15	15.0
Total	100		100.0

N=100

Majority 52.0 % of the subjects had Good knowledge, 33.0 % had poor knowledge, 15.0 % subjects excellent knowledge regarding Telemedicine

Table 3: Association between demographic variables and post test knowledge level of people residing rural area of Karad Taluka on Telemedicine

S. N.	Socio Demographic Variables	No. (%)	Post Test			Chi Square statistic	P value
			Poor	Good	Excellent		
			No. (%)	No. (%)	No. (%)		
1.	**AGE**						
	<30	7	5	2	0	11.85	0.16
	31-40	31	15	13	3		
	41-50	38	12	23	3		
	51-60	21	7	9	5		
	>60	3	0	2	1		
2	**SEX**						
	Females	35	10	19	6	0.54	0.76
	Males	65	23	33	9		
3	**Educational Qualification**						
	Professional or Honours	1	0	0	1	9.52	0.48
	Graduate orPost-Graduate	1	2	0	1		
	Intermediate or Post-High-School Diploma	0	3	0	0		
	Middle School Certificate	6	17	3	6		
	Primary School or Literate	12	19	4	12		
	Illiterate	13	17	8	13		
4	**Religion**						
	Hindu	86	36	41	9	2.72	0.26
	Muslim	14	3	8	3		
5	**Occupation**						
	Profession	1	0	1	0	5.24	0.88
	Semi- Profession	25	10	10	5		
	Clerical, Shop-owner, Farmer	36	12	20	4		
	Skilled worker	22	5	14	3		
	Semi-skilled worker	3	1	1	1		
	Unskilled worker	13	5	6	2		
6	**Family Income**						
	> Rs.45751	2	1	1	0	6.77	0.56
	Rs.22851-Rs.45750	8	4	3	1		
	Rs.17151- Rs.22850	19	6	11	2		

	Rs.11451-Rs.17150	49	18	24	7		
	Rs.6851- Rs.11450	22	10	10	2		
7	**Type of Family**						
	Nuclear	31	9	16	6	2.88	0.56
	Joint	58	21	31	6		
	Extended	11	3	5	3		
8	**Source of Information**						
	News papers	49	13	29	7	2,88	0.56
	TV	31	10	15	6		
	Health care workers	15	7	6	2		
	Radio	5	3	2	0		

[N=100]

N.S- Not significant S- Significant at P<0.05 level

The above table depicts the association of knowledge level of people residing rural area of Karad Taluka regarding Telemedicine after administering the Structured Teaching Programme with their selected demographical variables, using Chi –square test. The analysis revealed that there is significant association was found with age, ($p < 0.05$) and no association could be found with other demographic variables of people residing rural area of Karad Taluka with post test knowledge.

Discussion

Maximum of the subjects 38 (38%) were in the age group of 41-50years Dr. Mrs. M. S. Vinsi, Maximum of the subjects (42.5%) were in the age group of 31≤35yrs. 4 Majority of the subjects 65 (65%) respondent was males and the remaining 35 (35%) respondents of people were females. 38 (38%) subjects were illiterate, Dr. Mrs. M. S. Vinsi, *et al.* (2016) in their study observe that maximum of the subjects (62.5%) were B.Sc and Post Basic nurses. 4 Majority of people were 86 (86%) of people were Hindus and 14 (14%) Muslims. Majority of people were Clerical, shop owner or farmer i.e. 36 (36%). Dr. Mrs. M. S. Vinsi, *et al.* (2016) in their study observe that Majority of the subjects (30%) were working in ward and ICU. 4 Majority of people i.e, 49 (49%) monthly income was between Rs.11,451 - Rs.17,150. majority of people i.e. 58 (58%) of live in joint family. Majority of people i.e. 49 (49%) gained knowledge about Telemedicine from newspaper. Dr. Mrs. M. S. Vinsi, *et al.* (2016) in their study observe that Majority of the staff nurses (62.5%) had no experience of computer technology in clinical area. 4

In the table it is noticeable that majority of people 49 (49%) had good Level of knowledge whereas 39 (39%) of people had poor level of knowledge and only 12 (12%) people had Excellent knowledge regarding Telemedicine before administration of Structured Teaching

Programme. Dr. Mrs. M. S. Vinsi, *et al.* (2016) in their study observe that In pre test majority of the staff nurses (52.5%) had average knowledge, (37.5%) had poor knowledge & (10%) staff nurses had good knowledge & no subjects were in the category of excellent knowledge scores.

A 2019 American Hospital Association (AHA) publication, Fact Sheet: Telehealth, found a consistent positive trend in the number of hospitals using telehealth services. In 2010, 35% of hospitals reported full or partial implementation that grew to 76% of hospitals reporting telehealth usage in 2017. A 2016 *JAMA* article, Utilization of Telemedicine among Rural Medicare Beneficiaries, found telemedicine visits for rural Medicare beneficiaries increased from 2004 to 2013 at an annual growth rate of 28%. The article reports nearly 80% of rural beneficiary telehealth visits were for mental health conditions [11].

Telemedicine is a new branch of treatment. The more nurses know about it, better will be the patient care and prognosis. Once the nurses are trained in this emerging field of care, this will lead to a swing from illness to wellness. The findings of this study support the need for staff nurses to understand and rendering these modes of services in the hospitals and community settings in providing Tele based services and to spread this Knowledge to their future students, family, colleagues, clients and the public. This study has proved that the staff nurses have a remarkable increase in the Knowledge regarding Tele-medicine when compared to their previous Knowledge to the implementation of the SIM. The pretest-knowledge level of staff nurses on telemedicine were supported through a study conducted among nurses on Knowledge, perceptions and expectations in e-health in a children's hospital, Royal Children's Hospital Centre for Online Health. All available nurses working at a tertiary pediatrics hospital from 27 hospital departments were involved. A total of 365 questionnaires were distributed. A total of 253 surveys were completed (69%). Most respondents mentioned that they never had any e-health education (87%) and that their e-health knowledge and skills were low (71%), while few nurses reported some exposure to e-health through their work (11%). More than half of the respondents indicated that e-health was important/very important/critical for health professions (56%) while some were not sure about it (26%). The study concludes that Telemedicine education was necessary for adopting e-health services as 71% lacked knowledge and skills [12].

Academic and Practicing Clinicians through Telemedicine. From the results it was found that majority of the participants agreed that the presentations were related to their professional needs (95%),

increased their subject-matter knowledge (98%), were the best they had attended (81%), and that the presentations provided the information that could be translated into professional practice, enhancing

patient care (93%). This study concludes that participants were highly satisfied with Pediatric Physician Learning and Collaborative Education and consider it as an effective way to address the continuing education needs of practitioners throughout Arkansas, particularly in the rural and underserved areas.

Conclusion

Telemedicine can open a world of health-care delivery by building clinical bridges between patients and available health care, albeit contingent upon the costs and development of ancillary infrastructure and services. The telemedicine experiences in this study transcend India. Such experiences could have far-reaching benefits for poorer communities in developed countries as well as for developing countries.

Telemedicine has and continues to benefit the Indian health-care system in terms of preventive care and disease treatment. Several technology companies (Tata Consultancy Services, Wipro, Pent four Software, and Tata Unisys) are in the process of providing the telecommunication support needed for telemedicine, but much remains to be accomplished before telemedicine can reap its touted benefits for India's exponentially growing population. India is in a unique position for build. The Structured Teaching Programme was effective to increase the knowledge of rural population regarding telemedicine. There was significant association of the pre test knowledge scores regarding telemedicine among rural population and their selected demographic variables such as age, gender, education, occupation, Religion, and place of living.

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