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Tele-care and tele-alarms for the elderly: preliminary experiences in Mexico

ABSTRACT

OBJECTIVE: To analyze the effect of a pilot program of tele-assistance and tele-alarms on the elderly's self-perception of health status and to identify the satisfaction with and acceptance of the program.

METHODS: Cross-sectional study that included interviews with 378 elderly individuals, 294 caretakers/relatives and 53 health care professionals. The program was run in Mexico City in 2010. The variables were socio-demographic characteristics, self-rated health, satisfaction and acceptance of the program. The information was gathered through a standardized questionnaire. The statistical analysis included descriptive analysis and nonparametric tests.

RESULTS: Significant effects on self-perception of health were observed, 6.17 (SD 17.9 $p < 0.05$) points above the average. The program was well received and accepted by the elderly, family caregivers and health professionals.

CONCLUSIONS: The program helps to maintain or improve quality of life, allows preventive care and is an ideal means of providing psychosocial support to the elderly.

DESCRIPTORS: Aged. Remote Consultation, utilization. Patient Acceptance of Health Care. Continuity of Patient Care. Home Nursing. Health Services Research.

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INTRODUCTION

Demographic, epidemiological, social and economic changes have led to huge transformations in lifestyle, housing and family dynamics, leading to family members becoming increasingly involved in caring for the elderly. Health care systems in the majority of countries face significant challenges due to increased demand for medical care from the growing number of elderly individuals, increased demand for care within the home, the need for more efficient, higher quality and more equal health care services and the difficulty contracting personnel to provide health care and home care services.[3]

The information and communication technology has developed in parallel with these changes, which makes it possible to face the abovementioned challenges. Health care services, especially medical care, are developing innovative foci to deal with patients who need home care. This is the case with tele-care and tele-alarms, which constitute health and social care within the home.

Initiatives to provide home care services have started in Mexico. The *Instituto Mexicano del Seguro Social* (IMSS - Mexican Social Security Institute) initiated an Ageing Program in 2009, including the development of a pilot program of tele-care and tele-alarms consisting of providing health care within the home (via telephone, 24 hours a day). It is a social and health care intervention which ensures a rapid response to crisis or emergency situations through information, guidance and referral activities. The service users are individuals aged 60 and over, living alone or being alone most of the time, or those living with another individual in similar conditions; without serious hearing problems or mental disorders that limit ability to communicate.

The aim of this study was to analyze the effect of the pilot program on self-perceived health in the elderly and to identify satisfaction and acceptance of the program from these individuals, their caregivers/relatives and health care professionals.

METHODS

This was a cross-sectional study consisting of a household survey of users of the program and interviews with health care professionals in three family health care units belonging to the IMSS, located in Mexico City. Three standardized questionnaires were used, one for each target population: 378 elderly individuals who had been registered with the program for over six months in June 2010; 294 caregivers/family members and 53 health care professionals (heads of clinical departments, family doctors and social workers).

Two scales were used: The European Quality of Life-5 Dimensions (EuroQol-5) and the short geriatric depression scale (GDS). These scales had been validated for the Hispanic population. Data were collected during July 2010. The visual analogical scale and the GDS scale were applied to the elderly individuals on entering the program, time zero (t0), and after six months, time one (t1).

The list of service users for June 2010 was 404 elderly individuals, and a response rate of 94% was reached, due to: illness, death of spouse, refusal to respond and being away on holiday.

Mean age was 78.4 years (SD 6.5 years); 65.9% were women, half of whom had no partner, mainly due to being widowed (42.3%), 14.2% had no caregiver/relative and in 8.0% of cases two service users had the same caregiver/relative; 66.7% of caregivers/relatives were women, the majority aged between 40 and 59 (46.9%), usually children (56.5%), followed by spouses/partners (20.7%) or other family members (11.6%).

Data analysis included simple frequencies, contingency tables and intragroup analysis for dependent samples using the Wilcoxon test. Stata 11 software was used.

The protocol was approved by the Research and Ethics Committee of the *Instituto Mexicano del Seguro Social* (IMSS) Project No. FIS/IMSS/PROT/257; all participants signed a consent form.

RESULTS

Differences were observed between time zero and time one with regards a better perceived level of health on the part of the elderly individuals, with a mean of -6.17 (SD 17.90; $p < 0.000$).

Among the various services the program offers, the ambulance scored most highly (48.9% from the elderly individuals and 51.0% from caregivers/relatives); followed by immediate care 22.5% and 20.4% from the elderly individuals and caregivers/relatives respectively); 48.4% of the elderly individuals and 26.2% of caregivers/relatives had used the alarm button for various reasons, with the following reasons standing out among the former: pressing it by mistake (29.0%), in an emergency (16.9%, of which 38.2% was for falls), to chat (14.2%) or to check it was working (13.7%). Caregivers and family members used the button in emergencies (40.3%, of which 32.3% was for falls), to check it was working (14.3%), by mistake (13.0%) or to ask for information (7.8%). Among the elderly individuals who did not use the alarm button (51.6%), 89.2% had no need of it. The reported need was offset by the calls from the service operators: 96.5% reported

constantly receiving calls from the operators to check that the button was working (30.7%) or to monitor an illness of treatment (26.8%) (Table).

The elderly individuals (81.7%) and the caregivers/relatives (86.1%) considered that the responses they received from the operators helped them resolve the problem. The majority considered that the operators had provided a good service. The program became an important service in day-to-day life; 78.8% of the elderly individuals and 93.2% of the caregivers/relatives noticed improvements in the elderly individual's quality of life attributable to the program. They felt less dependent (32.0%), a perception that was shared by the caregivers/relatives (21.2%). Peace of mind regarding the increase in care after the elderly individual entered the program: 68.8% of the service users and 84.7% of the caregivers/relatives considered that since the elderly individual had entered the program the family had become more involved and supportive in care and 89.8% that the program provided a daily security for the elderly and their family with regards the care. Among the carers, 52.0% perceived improvements in health.

The health care professionals observed positive changes in the health of the patients (41.5%), decreased in prescribed medication (18.9%) and in demand for health care services (24.5%), attributing this mainly to adherence to treatment and following medical recommendations. These recommendations were supervised by the operators of the service. In total, 94.3% deemed the program to be valuable in monitoring and caring for patients.

DISCUSSION

For the first time in Mexico the effects on health and the satisfaction with and acceptance of a social and health care program within the home, using low cost technology, have been analyzed. This study made various important findings: a) the pilot program achieved significant improvements in the service users' perception of their own health; b) tele-care contributed to improvements in quality of life, the elderly individuals becoming less dependent and to the peace of mind of themselves and their families; and c) that it is feasible to develop social and health care services for the elderly within the home using technology, as there is good acceptance on the part of the elderly, their caregivers/relatives and of the health care professionals.

Tele-care was shown to influence improvements in levels of depression,[4] in quality of life,[5] decreasing visits to the emergency room and greater adherence to medical recommendations,[1] support in the case of falls, giving a feeling of security and reduction in anxiety,[2] the perception of more independent life and, with relation to the caregiver/relative, more free time, peace of mind and security.[5] Give the effects that the tele-care program had, the majority recommended the use of these services.[5]

The program meets the needs of individuals with concerning growing old within their own homes. Using technology in health care services is a viable resource for developing long-distance social and health care service programs for the elderly. Although there was good acceptance from all of the service users and from the health care professionals, greater adaptability to existing systems and the individual needs of the service

Table. Satisfaction and acceptance of the TATA pilot program on the part of the elderly individuals (n = 378), of their caregivers/relatives (n = 294) and of the health care professionals (n = 53). Mexico City, Mexico, 2010.

Variables	Elderly individual		Caregiver/relative	
	Total	%	Total	%
Knowledge of and use of the program				
Awareness of the services provided by the program				
Ambulance	185	48.9	150	51.0
Guidance	35	9.3	42	14.3
Emergency care	85	22.5	60	20.4
Psychological care	4	1.1	8	2.7
Other (calls to relatives)	18	4.8	14	4.8
Don't know	51	13.5	20	6.8
Use of the alarm button	183	48.4	77	26.2
Reasons for pressing the alarm button (n = 183)[a] (n = 77)[b]				
Emergency	31	16.9	31	40.3
Illness	15	8.2	5	6.5

Continue

Continuation

Request information	12	6.6	6	7.8
Check it works	25	13.7	11	14.3
By mistake	53	29.0	10	13.0
To talk	26	14.2	6	7.8
Other	17	9.3	7	9.1
No answer	4	2.2	1	1.3
Received calls from the operator	365	96.5	NE	NE
Reasons for receiving the call (n = 365)[a]				
Monitoring illness or treatment	98	26.8	NE	NE
Reminder of appointments	15	4.1	NE	NE
Reminder to take medication	15	4.1	NE	NE
Check button is working	112	30.7	NE	NE
To provide information about the service	14	3.8	NE	NE
Congratulations for some special occasion	54	14.8	NE	NE
Other	57	15.6	NE	NE
Satisfaction and acceptance				
Operators response helped solve the problem				
Yes	309	81.7	253	86.1
No	23	6.1	12	4.1
No answer	46	12.2	29	9.9
Treatment received from the operator was				
Good	361	95.5	282	95.9
Regular	6	1.6	2	0.7
Bad	4	1.1	1	0.3
No answer	7	1.9	9	3.1
Do you consider the tele-care service to have improved your quality of life[c]				
Yes	298	78.8	274	93.2
No	70	18.5	11	3.7
No answer	10	2.6	9	3.1
The tele-care program helped you to feel less dependent or more dependent on your relatives[d]				
Less	121	32.0	62	21.1
The same	208	55.0	208	70.7
More	46	12.2	20	6.8
No response	3	0.8	4	1.4
The tele-care program helped you to have more or less peace of mind				
Less	2	0.5	12	4.1
The same	113	29.9	29	9.9
More	260	68.8	249	84.7
No response	3	0.8	4	1.4
Would you rate the care received from the tele-care service as				
Good	341	90.2	271	92.2
Regular	13	3.4	7	2.4
Bad	9	2.4	6	2,0
No answer	15	4.0	10	3,4
In general, how would you rate the tele-care services				
Good	353	93.4	284	96,6
Regular	11	2.9	4	1,4

Continuation

Continuation

Bad	7	1.9	3	1,0
No answer	7	1.9	3	1,0
Would you recommend this program and do you think all elderly individuals should have access to it?				
Yes	363	96,0	287	97,6
No	6	1,6	3	1,0
No answer	9	2,4	4	1,4

Perception of the health care professionals (n = 53) of the TATA pilot program		
	Total	%
Are you aware of the tele-care pilot program and the services		
Yes	48	90.6
No	5	9.4
Have you observed changes in the health of those patients taking part in the tele-care program		
Yes	22	41.5
No	24	45.3
Don't know/No answer	7	13.2
Have you observed changes in the health of those patients taking part in the tele-care program		
Yes	22	41.5
No	24	45.3
Don't know/No answer	7	13.2
Do you perceive the health of the patients taking part in the tele-care program to be		
Bad	6	11.3
Regular	8	15.1
Good	33	62.3
Don't know/No answer	6	11.3
Medical prescriptions for patients taking part in the tele-care program have		
Increased	2	3.8
Decreased	10	18.9
Remained the same	41	77.4
Demand for health care services by patients taking part in the tele-care program has		
Increased	10	18.9
Decreased	13	24.5
Remained the same	20	37.7
Don't know/No answer	10	18.9
Do you consider this program to be valuable in monitoring and caring for elderly patients?		
Yes	50	94.3
No	3	5.7
Do you think this program should be extended to all elderly patients in the IMSS?		
Yes	49	92.5
No	4	7.5
How would you rate the services provided by the tele-care program?		
Bad	5	9.4
Regular	7	13.2
Good	41	77.4

TATA pilot program: Tele-care and tele-alarms pilot program
NE: Not evaluated
[a] Number of observations by elderly individuals
[b] Number of observations by caregivers/relatives
[c] For the caregivers/relatives column, indicate whether the elderly individual's quality of life has improved since entering the program
[d] For the caregivers/relatives column, indicate whether the program helped the elderly individual be more, the same or less dependent

users themselves is required. Only then will the program contribute to improving the health care provided by health care institutions to the ageing population.

Health care services within the home using such technologies are emerging in Mexico, thus in this field of research no previous data exists on the effects it may have on the physical, psychological and social health of the elderly and their caregivers/relatives. A limitation of this study was the lack of a complete foundation which would have enabled the impact on the elderly individuals' health and quality of life to be measured. Another was the lack of economic analysis that would have enhanced the study, providing better information on the impact of programs of this type on health care service costs.

REFERENCES

1. Chaudhry SI, Phillips CO, Stewart SS, Riegel B, Mattera JA, Jerant AF, et al. Telemonitoring for patients with chronic heart failure: a systematic review. *J Card Fail*. 2007;13(1):56-62. DOI:10.1016/j.cardfail.2006.09.001

2. De San Miguel K, Lewin G. Personal emergency alarms: what impact do they have on older people's lives? *Australas J Ageing*. 2008;27(2):103-5. DOI:10.1111/j.1741-6612.2008.00286.

3. Koch S. Home telehealth: current state and future trends. *Int J Med Inform*. 2006;75(8):565-76. DOI:10.1016/j.ijmedinf.2005.09.002

4. Kroenke K, Theobald D, Wu J, Norton K, Morrison G, Carpenter J, et al. Effect of telecare management on pain and depression in patients with cancer: a randomized trial. *JAMA*. 2010;304(2):163-71. DOI:10.1001/jama.2010.944

5. 5. Mitseva A, Peterson CB, Karamberi C, Oikonomou LCh, Ballis AV, Giannakakos C, et al. Gerontechnology: providing a helping hand when caring for cognitively impaired older adults-intermediate results from a controlled study on the satisfaction and acceptance of informal caregivers. *Curr Gerontol Geriatr Res*. 2012;2012:ID401705. DOI:10.1155/2012/401705

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