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Feature Article

Health workers perception on telemedicine in management of neuropsychiatric symptoms in long-term care facilities: Two years follow-up

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ABSTRACT

The management of neuropsychiatric symptoms is a challenge in long-term care facilities. Our objective was to assess the perception of telemedicine, as a useful tool to connect staff to specialized units. In this multicenter prospective study, 90 patients from ten facilities benefited from 180 sessions over two years. The primary outcome was the perception of telemedicine evaluated through semi-structured interviews at baseline and two years later. Our results revealed positive perceptions of telemedicine, confirmed after two years of real-life experience with its use. Not only do staff members believe that telemedicine is not a downgraded version of medicine, but they also believe that it could improve the quality of care. They expressed a very positive sense of recognition of their professional qualifications and indicated their need to be involved in change processes to ensure successful implementation and better adherence to telemedicine as a service.

Introduction

Neuropsychiatric symptoms (NPS) of dementia affect 80% of patients during the disease course.[1,2] Hallucinations, agitation and other disturbing NPS are associated with a poorer disease prognosis, inappropriate treatments, an increase in professional caregiver burden and health care costs.[3-5] Management of NPS is a challenge for the staff of long-term care facilities (LTCF)[6,7] where the prevalence of dementia can be as high as 70%.[8-10] NPS also frequently result in inappropriate use of emergency facility networks[11] despite the negative impact on patients' functional autonomy and quality of life.[12-14] The older population living in LTCFs is particularly exposed to the risk of decompensation in the event of stressful situations such as transportation to emergencies. While the situation is not new, the recent viral pandemic is a dramatic reminder of this fact. Social distancing measures also pose significant challenges to the health and well-being of older people with cognitive impairment. Reduced cognitive stimulation that accompanies socialization can aggravate cognitive symptoms and NPS.[15] Older patients are paying the heaviest price in terms of COVID-19 mortality rates.[16] However, they also have high rates of morbidity and mortality from other acute and chronic conditions. Thus, containment measures have potentially deprived them of necessary specialist care. This has been a key factor in the rapid development of telemedicine tools for teleconsultation or tele-expertise to provide minimal access to care for these populations.

Non-pharmacological therapeutic approaches of NPS show the best evidence-based results and are the first line of treatment considering that environmental causes are among the most common NPS triggers.[17,18] These approaches are based on a comprehensive multidisciplinary assessment and a subsequently tailored person-centered care plan. This explains why evaluation outside a real life context (e.g. hospital setting) is biased and partial. Furthermore, this evaluation requires a change of environment that might aggravate the patient's behavior. Telemedicine (TM) could be a useful support to connect LTCF staff to specialized units and thus provide a comprehensive and ecological evaluation without aggravating NPS. Several studies have evaluated TM for older patients with encouraging results[19] and data suggests its validity for dementia diagnosis.[20-22] However, health professionals are facing a low level of diffusion of TM in real clinical care settings, including long-term care facilities.[23] Decades after the first TM initiatives, we should be focusing on how to overcome this relative failure. Besides technical, economical and regulatory issues,

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all innovations have a social component. Sociology reminds us that individuals confronted with an innovation often begin by counteracting it.[24] Such reactions do not only reflect fits of temper but sometimes reveal plausible fears (e.g. quality of care for the patients).[25]

This multicenter study evaluates health workers perception on telemedicine in management of neuropsychiatric symptoms in long-term care facilities.

Materials and methods

Study design and procedure

This study is a multicenter, open-label trial. We evaluated LTCF staff perceptions of TM for NPS management before and after its implementation. Ten LTCF were recruited for a 24-month follow-up period. The study received ethical approval from the local institutional review board (September 09, 2014). Written informed consent was required from all participants. The trial was registered in ClinicalTrials.gov, June 1, 2015. Full details of the research and assessment procedure have previously been described.[26]

When a patient presented a disruptive NPS (defined as NPS that can be stressful and/or difficult to manage, based on family or professional assessment and which requires a specialist consultation or an unscheduled hospitalization according to LTCF staff) a TM consultation was scheduled within 72 hrs. The LTCF physicians were acting as medical investigators and requested the TM consultation from memory expert centers. The study involved two expert memory centers (University Hospitals) in two French regions (named 'Region 1′ and 'Region 2′). The TM session was led by a geriatrician trained in NPS management along with specialized NPS nurses. The LTCF participants were LTCF physicians, nurses, psychologists, the patient's GP when possible and the patient if required. A tailored personal plan with a therapeutic strategy was established after the TM session. A second follow-up TM consultation took place after 1 month.

Study outcomes and analysis

We used a qualitative research design using semi-structured interviews. Our primary outcome was a qualitative assessment of TM perceptions after implementation among the LTCF staff. Our hypothesis was that perception of TM by LTCF staff would be improved after a 2 year implementation.

A senior social science researcher (University Sociology Laboratory) conducted face to face group interviews in both sites ('Region 1′ and 'Region 2′): before and after experiencing TM. The first staff meeting took place before the inclusion of patients, and the second staff meeting took place after TM implementation, two years later. Each interview lasted half a day and was designed to explore key questions relating to TM perception by the LTCFs' staff. . The interviews were conducted as following:

- For the first interviews (before the implementation of TM), non-directive exchanges were conducted in order to identify recurring themes. These themes were then used as a guide to finalize the interviews in a semi-directive mode (reformulation and theme development).
- For the second session (Two years later), semi-structured interviews were conducted based on the same themes previously identified, and an additional questionnaire was distributed individually (a combination of open and closed questions addressing these themes, see supplementary file 1).

All interviews were transcribed. The transcripts were analyzed using a conventional content analysis along with a summative qualitative content analysis.[27] The Strengths, Weaknesses, Opportunities and Threats (SWOT) method[28] was applied to illustrate future determinants of larger implementation. For the description of LTCF and the analysis of the questionnaires, variables were described in percentages, means and standard deviations. Statistical analyses were performed using STATA software.

Results

Descriptive analysis of the LTCF

A total of 10 LTCF were included for 24 months and were equipped with TM for NPS management in addition to the standard health care services available in their area (for full details of the procedure see Piau et al.[26]) The LTCF had a mean number of 85 beds (min 60, max 133). The distribution of the number of beds, "specialized" professions in the LTCF (in addition to nurses, auxiliary nurses and night shift workers), full-time equivalent jobs for each profession, and whether or not non-pharmacological approaches were used in the LTCF are presented in Table 1.

Perception of tm among the ltcf staff (primary outcome)

During the first interviews (before the implementation of TM), we identified recurring keywords/codes from the first non-directive exchanges. Then, we identified several key themes to conduct the rest of the interview in a semi-structured mode (example codes are given in brackets):

- Organizational issues (LTCF organization, healthcare system organization);
- Financial impact (the financing of the LTCF, healthcare system financing);
- LCTF staff issues (staff involvement, staff cohesion, valuation of staff work, valuation of staff expertise, staff relationship with families and GPs, knowledge transfer, continuing medical education);
- Quality of care (NPS diagnosis quality, administered treatments appropriateness, transfers and hospitalizations relevance, specialized healthcare access).

Table 1
Description of the LTCF.

Characteristics of the 10 LTCF that were included	
Admission capacity, Mean (SD)	
Number of beds	84.9 (26.8)
Number of beds in the special dementia unit	10.2 (11.4)
Number of LTCF that benefited from "special" professionals (%)	
Ergotherapist	6 (60)
Psychologist	10 (100)
Psycho-motor therapist	4 (40)
Number of LTCF that benefited from non-pharmacological therapy (%)	
Any non-pharmacological therapy (yes)	8 (80)
Balneotherapy (yes)	5 (50)
Luminotherapy (yes)	0 (0)
Aromatherapy (yes)	0 (0)
Music therapy (yes)	5 (50)
Snoezelen (yes)	1 (10)
Pet therapy (yes)	6 (60)
Full-time equivalent jobs, mean (SD)	
Nurse	4.0 (2.4)
Auxiliary nurse	3.9 (1.8)
Night shift workers	3.6 (2.4)
Ergotherapist	0.5 (0.7)
Psychologist	0.2 (0.4)
Psycho-motor therapist	0.3 (0.5)

†Abbreviations: SD, Standard deviation; LTCF, long term care facilities.

During the 24-month follow-up period, 90 patients were included and each one benefited from two TM sessions; a total of 180 were conducted. Perception among LTCF staff was evaluated beforehand and two years after TM implementation.

There was a clear change in staff members' perceptions between the first meeting (before TM implantation) and the second one (two years later, after TM implantation). At the first meeting, 49% of the LTCF staff expressed positive perceptions concerning TM in 'Region 1′ and 40% in 'Region 2′. Two years later these figures rose to 78% and 76% respectively. On the other hand, negative perceptions classified as weaknesses expressed by participants increased twofold (15 to 22% in "Region 1″ and 8 to 15% in "Region 2″), while those identified as potential threats clearly decreased (52 to 9% in "Region 2″) or even disappeared (36 to 0% in "Region 1″). No one expressed a clearly negative or even hostile perception during either meeting. The labeling of the statements by social science researchers did not raise any problems since they were all clearly positioned. Table 2 summarizes the main issues raised during the two meetings. Table 3 present the aggregated results of the questionnaire analysis (2nd meeting) for both regions 1 and 2.

We observed that the impact of TM on health care organization was positively perceived by participants. They saw TM as an opportunity to tackle the lack of specialized health care in remote areas. However, despite this generally positive perception, there were also concerns that an unequal healthcare system could develop. With respect to the participation of general practitioners (GPs), the discussion highlighted the difficulties in motivating several of them. Some refused to implement the proposed pharmacological interventions, which was very frustrating for the staff. When staff members met with the GPs, the results were more satisfactory. There were no major difficulties in the TM process implementation in 'Region 1′. The situation was different in 'Region 2′ where two concerns were highlighted the lack of time and the difficulties of several staff members to cope with change. LTCF staff issues are addressed in table 3. Concerning staff cohesion, the valuation of staff work, and experience sharing, the perceptions of TM impact are almost all very positive, there were few negative or mixed comments.

Concerning patients' family involvement and relations, in the 'Region 1′ there were no difficulty obtaining family consent (100%). In comparison, the 'Region 2′ staff had some difficulties with family adherence in more than one out of three TM sessions (36%). When relatives participated in the TM sessions (11 occasions) this involvement was considered as positive three out of 4 times in 'Region 1′ (75%) and 6 out of 7 in 'Region 2′ (86%). With regard to the feared risk of a possible dehumanized medicine offering a lower quality of care, table 3 clearly shows that this concern has disappeared after two years. It is also clear that the first meeting identified negative perceptions (Table 2) that no longer exist two years later. LTCF staff considers that the estimated number of hospitalizations avoided is 13 for 'Region 1′ and 20 for 'Region 2′. The two emergency TM sessions held during the study were similarly considered to have had a positive impact for the patient.

Table 2
Summary of Staff perceptions concerning TM.

First meeting (2015)		Second meeting (2017)	
'Region 1′ LTCF	'Region 2′ LTCF	'Region 1′ LTCF	'Region 2′ LTCF
Positive perceptions			
Tackles the lack of health care in remote areas	Tackles the lack of specialized care in remote areas		
Lowest health care costs			
Stronger team spirit and interdisciplinary collaboration	Improved expression by all staff participants and interdisciplinary teams	Involvement of all participants, families and auxiliary nurses	Better team mobilization and interdisciplinary collaboration
		Increased knowledge of the LTCF staff	Positive effect of exchange of views
		Better valuation of LTCF staff work	LTCF staff work valuation
	Better evaluation of patients in their own environment		Better evaluation in patients' own environment
Easiest and faster access to specialized health care	Improved access to health care		Easiest access to specialized health care
Minimization of patient transfers and hospitalizations	Minimization of transfers and stress for patients		Fewer transfers and less stress for patients
	Emergency solutions for crisis situations		Positive impact on NPS
			Promotion of non-pharmacological treatments
Negative perceptions			
TM is a "spare wheel" that does not solve the lack of specialized care in remote areas			
Concerns about a possible loss of interest by GPs	Concerns about possible opposition from GPs	Concerns about CPs opposition	
Possible disorganization of the current health care network	Possible disorganization of LTCF functioning	Lack of time and workforce for TM	
	TM is not a financial priority		
Concerns about the adoption of TM by LTCF staff	Concerns about TM adoption by LTCF staff		Difficulty changing, a sense of intrusion
Concerns about a possible loss of interest by LTCF staff and systematic referral to TM			
TM introduces two-tiered dehumanized medicine	TM introduces two-tiered medicine		
	Concerns about the ethics of remote health care and health data security		

†Abbreviations: LTCF, long term care facilities; TM, telemedicine.
‡Note. Several regions of France are impacted by a decrease in the number of doctors, particularly GPs. In some regions this can have an impact on the quality of care, it is now referred to as the medical desertification.

Table 3
Results of the questionnaire analysis.

Issues addressed by open and closed questions	LTCF staff response rating (%)		
	Positive	Split	Negative
Organizational issues, TM does...			
... tackle the lack of healthcare in remote areas	55.0	20.0	25.0
... provide real solutions for the lack of healthcare in remote areas	45.4	9.1	45.5
... not introduce two-tiered medicine	66.7	9.5	23.8
... lower costs for the health care system	63.7	9.0	27.3
... lower costs for the LTCF	55.5	11.2	33.3
... benefit the organization of health care	75.0	12.4	12.6
... have a beneficial impact on LTCF organization	63.2	15.8	21.0
... not cause GPs to lose interest in the care of LCTF patients	63.6	18.2	18.2
LTCF staff issues, TM does...			
... contribute to interdisciplinary collaboration	77.8	11.0	11.2
... contribute to team cohesion	90.9	0.0	9.1
... contribute to knowledge transfer and continuing training	84.2	5.3	10.5
... promote valuation of LTCF staff	81.8	18.2	0.0
... promote valuation of auxiliary nurse expertise	72.6	18.3	9.1
... enable greater involvement of staff in NPS management	62.6	10.3	27.1
... provide external support for burdensome situations	80.8	19.2	0.0
Patient-related issues, TM does...			
... improve the quality of NPS diagnosis	77.6	11.5	10.9
... improve the speed of NPS diagnosis	58.3	25.0	16.7
... promote the re-evaluation of psychotropic drugs	83.3	16.7	0.0
... promote faster re-evaluation of psychotropic drugs	72.8	18.0	9.2
... improve access to specialized care	66.7	25.1	8.2
... reduce patient transfers	75.0	13.1	11.9
... reduce hospitalizations	76.9	15.4	7.7
... reduce patient stress	54.4	9.3	36.3
... make the patient the focus of care again	82.1	0.0	17.9

†Abbreviations: LTCF, long term care facilities; TM, telemedicine.
‡Note. Empirical scoring and interpretation was done by the sociology team after summarization of the open and closed questions. A "positive" interpretation means a positive perception of the potential influence of TM, e.g. for the item "TM could cause GPs to lose interest in the care of LCTF patients", the global perception that emerges is that "no", TM would not cause GPs to lose interest.

A final summary of staff perceptions after TM implementation (second meeting) using a SWOT template is presented in table 4. We observed that staff members felt fully acknowledged for their specific skills, and TM was perceived as positive for patient care.

Table 4
Summary of staff perception of TM after implementation (2nd meeting).

Strengths	Weaknesses
Organizational aspects	
• Easiest access to specialized health care	• Difficulties involving GPs
LTCF staff issues	
• Greater involvement of Staff in NPS management • Increased knowledge transfer • LTCF staff work valuation	• Difficulty coping with change • Feeling of intrusion
Family issues	
• Greater involvement of families	• Difficulties obtaining family consent in several cases
Patient issues	
• Better evaluation of patients in their own environment • Positive impact on NPS • Promotion of non-pharmacological treatments	• None
Opportunities	**Threats**
Organizational aspects	
• Tackling the lack of specialized care in remote areas • Lowering costs for the health care system	• Economic issues at the LTCF level
LTCF staff issues	
• Improved continuing training • Full recognition of staff members' specific skills • Better team cohesion and interdisciplinary collaboration	• Lack of time and workforce for TM development
Family issues	
• More trusting relationship with staff	• None
Patient issues	
• Fewer transfer and hospitalizations and less stress	• Introduction of a two-tiered medicine

Discussion

Main results

In this study, we focused on assessing perceptions of telemedicine in the real world, which is a key issue for future deployment. This is not an observational study to assess the willingness of end-users to adopt TM, but rather an interventional prospective study to assess the perception of TM before and after its actual use. This is a global and relevant primary criterion that meets the overall objectives of this type of study because large implementation of health care technologies largely depends on end-users' perception.

The health care professional positive perceptions at the very beginning are confirmed at the end of the study: the theoretical advantages prior to implementation became a reality according to end-users after 2 years of field experience. On the other hand, the negative aspects of TM perceived by staff members during the first meeting were much more varied and numerous compared to the second meeting two years later. We could say that some issues which seemed to be very important before the TM experience were less significant retrospectively. After two years, some negative aspects whose potential consequences could be overestimated a priori became mere inconveniences to be taken into account but not disqualifying. It could be said that potential threats became weaknesses. Real-life experience with TM use concretized some doubts into certainties and there was no more questioning. Participants initially raised questions about the possibility of LTCF disorganization, dehumanized medicine, and a focus on cost minimization rather than quality of care. These fears did not disappear but were rationalized. They are now possibilities that require attention but are not inevitable. None of the concerns about a possible decrease in the quality of care were reiterated. Not only do staff members think that TM is not a downgraded version of medicine but they also believe it could improve the quality of care and make patients the focus of care again.

The auxiliary nurses expressed a very positive feelings of recognition of their professional qualifications and that they had not been listened to enough in the past (although they are very close to the patients and can provide useful information and solutions). The results of our study reveal positive LTCF staff perceptions about the potential influence of TM on staff work, staff consideration, and the quality of care. They also indicate the necessity to involve staff members in the change processes and to address local organizational issues to ensure successful implementation and better adherence to telemedicine as a service.

Our results in the context of previous research

Despite the fact that TM could be an emerging method of providing care for LTCF residents presenting NPS, to our knowledge, our study is the first trial specifically designed to explore this specific topic. Among the numerous studies that assessed remote cognitive assessment of patients living in LTCF,[22-24,29-32] few addressed TM implementation for NPS management. None of them used a social evaluation approach. Several preliminary non-comparative pilot

studies described TM solutions that linked a single LTCF[30,31] or nursing care unit of a rural hospital[32] to a specialized center with encouraging results. In a more recent paper Georgeton et al.[33] reported TM activity in three nursing homes. The main aim of the study was not TM evaluation for NPS but most of the teleconsultations concerned neuropsychological issues (83%). Catic et al. evaluated a TM solution specifically dedicated to NPS management of long-term care residents with dementia, and the results were encouraging.[34] This one-year follow-up non-comparative pilot study proposed bimonthly TM sessions to 11 long-term care sites to discuss cases with a specialized team. However, this study differed from our protocol because the intervention focused more on staff training than on the deployment of a TM care service. In fact, staff training is a valuable potential collateral benefit of our procedure (table 2) that helps LTCF staff to acquire up-to-date skills for NPS management. Staff training interventions have also been shown to reduce work-related stress and staff turnover and to decrease antipsychotic prescription for patients with dementia living in LTCF.[35-37] Moreover, the best evidence-based NPS treatment is demonstrated by non-pharmacological approaches that provide education and training for caregivers.[18]

Limitations of the study

We included LTCF staff in the early stages of project specification, including the definition of the tele-expertise process. Their participation from the very beginning of the project has probably influenced our results, which was a desired bias of our approach. Measuring the perception of a procedure has the disadvantage of confronting people with a preconceived project without any opportunity to modify it. To avoid this, we choose a method more in line with participatory design approaches that emphasize the involvement of users in the innovation process.[38] Our overall positive results tend to validate such an approach. We should accept the fact that all new organization could be scrutinized and criticized by end-users. Collective consultation prior to the project enables involvement of those with ideas to enrich the project and at the same time those who, without this critical examination, could became unconditional objectors.

The questionnaire used during the second session was developed for this study based on the themes identified during the first interviews session and we are not in a position to provide elements of reliability and validity. Moreover, a single researcher carried out the semi-structured interviews (scoring and interpretation of the staff feedback relied on its subjective interpretation). This therefore limits the generalization of our results.

This protocol main limitation was the duration of follow-up per patient (2 months), and the total duration of the study (2 years). It could be insufficient to assess organizational aspects and perceptions over a longer period once the innovation becomes routine. We have also deliberately set aside technical issues (robustness of service and service failures) in this paper (that are fully explored elsewhere).

Perspectives

Although older adults living in LTCF are highly susceptible to death from COVID-19, their non–COVID-19 care should not be forgotten. In this very particular context, it is necessary to bear in mind both the risk of presenting an atypical form of COVID infection (such as delirium or NPS) and at the same time not to neglect the other pathologies in this population.[15] Similarly, while telehealth is a very promising and relevant tool in this population, it complements rather than fully substitutes for other care options. We must be careful not to offer the same care in all situations, which are very heterogeneous, and not to delay hospitalization if it is necessary. The COVID pandemic has been a major accelerator in the large-scale deployment of telemedicine. The challenge now is to make it an additional option for better quality of care rather than a backup solution.

Conclusion

Our results reveal positive LTCF staff perceptions regarding TM influence on the health care system, staff work and staff consideration, and the quality of care. These results have been confirmed and even reinforced after the actual use of telemedicine. We also highlighted staff members' willingness to be involved in change. The results of our study could be useful both to extend existing TM networks in other regions and to design a national multicenter randomized trial to assess the efficacy of TM for NPS management.

Conflict of interest

None

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Ethical approval information

The study received ethical approval from the local institutional review board (September 09, 2014). Written informed consent was required from all participants (or legal representatives). The trial was registered in ClinicalTrials.gov, June 1, 2015.

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Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.gerinurse.2020.07.009.

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