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S.O.S. Ulcer E-learning: A continuous and integrated distance learning project regarding skin ulcers in the elderly population in Veneto region (Italy)

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One of the most significant problems that a frail elderly person can experience is the development of skin lesions. This problem is particularly important since it can have a serious impact on one's general health and quality of life. Although it is a significant and frequent problem, in many cases it can be averted by the proper assessment of an individual's vulnerability and by preventive interventions. For this reason, over the last few years the ULSS 16 of the Veneto Region, with the collaboration of health organizations from neighbouring territories, has promoted a series of training initiatives aimed at raising the awareness of this problem amongst health care professionals

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working directly with the elderly as part of the local network services. In 2010, as a result of our significant experience with traditional educational approaches, a portal for distance learning on this issue was created. The trial phase of this platform has allowed us to reach over a thousand operators, including doctors, nurses and other professionals working in the social health services. In addition, it was possible to activate a dedicated link to non-professional caregivers (family members/carers). This article illustrates the development phases of the platform, the training content, and the assessment of the system's performance as part of the accreditation of distance learning in the Veneto Region.

1 Introduction

At the International level skin ulcers are recognized as being an extremely important issue for those who experience them firsthand (Allman, 1989). Even though the problem is in part avoidable through prevention and early treatment, aging populations coupled with a more wide-spread prevalence of chronic degenerative diseases, are leading to potentially higher increases in the number of patients and more economic and structural burden on resources (Smith, 1995; Weststrate, 2001; Coleman, 2002; Vanderwee, 2007).

The entire multidisciplinary team, including "non-professional" caregivers (family members, etc.), can be involved in the prevention and early detection of these lesions (Reddy, 2006). This brings about the need to develop highly integrated training programs across a broad spectrum, and ones that are not only aimed at healthcare professionals. In the literature available today, many authors have suggested how e-learning can help overcome, especially in geographically vast areas, the many obstacles that inherently limit such integration in the training on skin ulcers (Jones, 2007). However, despite the literature the real world examples of distance learning being applied in this field are scarce (MacDonald, 2007; Beeckman, 2008). This prospect was taken into consideration by the Local Health Unit ULSS 16 of Padua, in the Veneto region, which for the last decade has been involved in initiatives to raise healthcare workers' awareness regarding this problem in the elderly population across the network of territorial health services in the province.

2 Background

Over the last few decades assistance given to the elderly with chronic diseases has shifted from a hospital setting to a network of local health services including home based services (visiting nurses), nursing homes, and day ambulatory centers. In these structures the care is primarily given by nurses and nurse assistants, which leads to a reduction in the standard of care provided when compared to a hospital center where acute cases are seen and treated. The distribution of an extremely high number of patients across different facilities, allows the Health Service, on one hand, to offer multiple and more personalized

services to the population, but on the other hand, it increases the difficulty of staff management and imbalances in the training the personnel receives can arise. We estimate the target number of staff members in the province of Padua to receive training in this field to be more than 2000. This number includes doctors, nurses, and other healthcare workers, many of whom are not obliged to take part in Continuing Medical Education (CME). The present project must be placed, then, in the proper context of our systemic need to train our personnel so that their professional profiles, theoretic and operational competencies, and learning tendencies all fall in the same range without gross imbalances. It must be noted that up until now, in Italy, there is no set of criteria for evaluating CME distance courses. The specific project we will be discussing here is one of a larger group of three experimental projects monitored by the Veneto region, and is being carried out in collaboration with the Education Department of the University of Padua which is responsible for defining the criteria for assigning CME credits at the regional level.

3 Materials and Methods

3.1 Measuring the Training Needs

In 2004, the Health services in the province of Padua defined and then handed out 'Treatment Profiles' for skin ulcers among its network of facilities. Out of this act came the need to measure in detail the uptake of such initiatives and the quality of the assistance and training surrounding this issue. The information arriving back in from various facilities was, in fact, extremely irregular and not usable, as was the data from the literature which varied widely by context and specific case studies (Smith, 1995; Sarti, 2003). The first step was to create a common language to be used among the various social and healthcare services in the province. A skilled 'clinical expert' was identified and assigned to each facility. In the end, the experts selected totaled almost 40 nurses. In 2006, by using this network of experts, an epidemiological study of prevalence was carried out. This study measured the dimensions of the skin ulcer phenomenon in home-assisted patients as well as those in social/residential or healthcare facilities. This was followed up by a prospective observational study on a sample of skin ulcer patients which analyzed how to manage the problem (process indicators; adherence to scientific literature and protocol) and the results of such processes (outcome indicators and overall costs). The data collected allowed us to target precise training needs within the network, as well as to define indicators for evaluating results and the potential impact, both in terms of care provided and resources saved, that any implemented programs may have.

Discussions surrounding these data also led to the study of which factors most contributed to a reduced adherence to guidelines at many levels: risk evaluation, skin ulcer prevention, correct diagnosis, and proper treatment management. Some constraints on the system were, therefore, highlighted in the different care settings and were taken into consideration when planning out the training programs, such as: high turnover of the nursing staff in residential facilities, few opportunities to seek advice from or talk things over with colleagues, little time available to dedicate to training, high percentage of non-mother tongue personnel, etc.

All of these factors made us think about the training strategies that were in use at the time and pushed the study group in a different direction to develop new programs.

3.2 Defining the Target and Training Program Strategies

Among the various services spread out over the territory (visiting nurse/home care and nursing homes), past experiences led to the idea that, assuming there was collaboration amongst colleagues, the training of key personnel inside teams of workers would help increase knowledge of the entire group. In reality, this approach produced scarce results and after analyzing the obstacles inherent in these types of services, we realized that the target audience for this type of training program has to be as wide-ranging as possible, both in terms of the number of participants and the professional qualifications of the participants (doctors, nurses, nurse assistants, and other healthcare workers). To this end, it was also essential to define the way in which each single professional figure could contribute to the management of the problem. In addition, some modifications had to be made to render the language of the scientific material more palatable for healthcare workers from various educational backgrounds as well as for those who speak Italian as a second language.

In order to fully understand all of the technical and organizational difficulties that might have impacted a new training program, an open dialogue was created with both the private and public facilities in the territory. One of the key points that emerged from these discussions was the difficulty of the facilities, even in the face of regional standards and obligatory training foreseen by law, to be able to concede time and therefore always guarantee the presence of their employees at further training events.

Thus, the decision was made to pass to a distance learning model in order to facilitate the access to training programs by adopting a technological platform which we named the 'S.O.S. Ulcer Portal.' The site was developed in the "Moodle" (Modular Object-Oriented Dynamic Learning Environment) environment, which is an open source platform for e-learning via the web. Moodle is highly

customizable and offers many possibilities for students to interact amongst themselves or with trainers. All of the didactic objects (chapters) were designed in the scorm format in order to be able to monitor in detail the user's activity.

With the various heads of the different facilities, in view of their organizational necessities, it was decided that the personnel could spend about 10 hours per year on skin ulcer training. With the wider three-year project in mind, the first step was to develop a starter course aimed at covering the gaps and critical needs in the adherence (non-adherence) to guidelines that was noted during the studies. This course consisted of 10 didactic modules, corresponding to 10 hours of training. To maximize the communicative effectiveness, a more visual language with icons, schematic representations, and animations was chosen. This was also enriched with audio commentary and voice-overs. Quizzes and exercises in which the students must pass to move on were inserted within the modules in order to evaluate comprehension and to reinforce important concepts aimed at correcting professional conduct.

The course was designed so that each user could go at their own pace autonomously while still receiving organizational and technical support from their facilities both during lessons and exams. In fact, support for the users was organized at various levels, the first being that each facility had a project coordinator responsible for keeping contact with the users and guaranteeing technical support for everyday problems of an IT nature.

As a second level of support, a help desk was set up remotely in order to assist in resolving technical issues, and there was also support regarding the content and clinical side of the program (in the form of feedback from an expert). In order to maintain the added value that one has in face-to-face session with a trainer in a normal in-house training, the e-learning students were offered the opportunity to interact with trainers via the web portal, with adequate response times in order to help the individual user in the field (Sherman, 2010). The ability to interact with an expert lasted for the entire duration of the course, and allowed us at the back end to gain know-how and competencies in analyzing certain situations that we would not have been able to do without the presence and problem solving capabilities of said experts. That is to say, we would not have gained this knowledge with just the use of a simple session with classic training material. Such support given from a distance also allows for a much more flexible and timely distribution of resources, thus overcoming some of the organizational issues reported earlier.

Lastly, in order to encourage user feedback, a forum was opened on the 'S.O.S. Ulcer' site where students at the end of their course could exchange comments, opinions, and voice any issues they might have had.

3.3 Assessing the students' progress

The aim of the course is to supply the user with the know-how and competencies to correctly and appropriately manage patients within their own work context who already have skin ulcers or those who are at risk for developing them, and thus, to take on the responsibility for making the proper decisions on the course of action (depending on professional level and qualification). For this reason, a 'performance table' (much like a 'can-do table') was created for each professional figure involved in the S.O.S. Ulcer project where for every learning objective there were assigned different levels of knowledge, skills and/or competencies that the user had to acquire (table 1).

TABLE 1
Performance matrix (example of a description)

Description:	Indicators:		
	Level 1	Level 2	Level 3
Being able to decide what to do in order to reduce risk (involving other professional figures, mobilization, utilization of aides, anti-decubitis systems…)	- Is able to describe and implement measures autonomously to reduce risk - Knows the procedures to reduce risk	- Is able to describe and implement measures autonomously to reduce risk - Knows the procedures to reduce risk - Can describe the different types auxiliary aides adept at reducing risk - Can describe the criteria needed for using anti-decubitis aides	- Is able to describe and implement measures autonomously to reduce risk - Knows the procedures to reduce risk - Can describe the different types auxiliary aides adept at reducing risk - Can describe the criteria needed for using anti-decubitis aides - Can describe the correlation between types of auxiliary aides and risks involved in using them. - Can evaluate outcomes critically so that strategies can be developed and/or changed

These matrices were then used for the final evaluation of each individual. Different questions were prepared for each indicator present in the performance table matrix that could be then randomly pulled onto the final exam. There were 120 questions in the database pool, none of which had been seen by the students

previously during the quizzes inserted in the didactic modules. Rules for the construction of the final test were then established taking into consideration the indicators for each professional level.

The final test, worked on in collaboration with the Education Department at the University of Padua, was built using the powerful test making functionality in Moodle. Users were only able to access the test after successfully completing (and passing) all of the didactic modules. To guarantee maximum validity, final test takers were required to take the exam (even if done on the computer via web) in a predefined center at a predefined time. The users had to show identification upon entrance to the session and were then given a password (which changed every session) to access the test. Each user was allowed 40 minutes to complete the test which was comprised of 20 randomly chosen multiple choice questions. As stated before, the questions were collated from the pool of 120 questions. At the end of each test, the users were obliged to fill out a questionnaire assigning a grade from 0 to 7 on different aspects of the course.

The project was done to fill a gap in the training needs of the province of Padua, but at the same time it met a need of the Veneto region to start experimenting with distance learning for CME accreditation. The correspondence and sharing of objectives between the S.O.S. Ulcer project group and the Veneto region allowed us to combine levels of experience and expertise to reach the results presented here.

4 Results, Discussions and Conclusions

During the first year of the S.O.S. Ulcer site, 1334 passwords were requested for users by facilities adhering to the project. Most requests were on behalf of nurses (903), followed by nurse assistants (364), doctors (26), and lastly, other figures such as physiotherapists, psychologists, or social workers operating inside nursing homes or other facilities (41).

The actual utilization of the site was by 50.6% of the users signed up by the facilities. Of these, 72% completed the course on schedule, with completion rates varying depending on professional level. Between the participants who had a CME requirement to fulfill and those who didn't, there were no particular variations in completion rates (nurses 73.8% and other figures 72.2% (CME requirement) to nurse assistants 69% (no CME requirement). The only exception group were doctors who had a completion rate of 52.7%, but whose sample size was quite low.

97.7% of participants who took the final exam passed it, without large variations across professional positions.

For the questionnaire given at the end of the final exam, the average score for each individual question was 6.4 (from 0 to 7, 7 being the highest. Fig. 1).

The items that received the highest marks were those that had to do with the relevance of course material to the everyday professional tasks of the participants and the direct impact that the course material had on their work. More than one third of the participants left voluntary feedback in the comments box at the end of the survey.

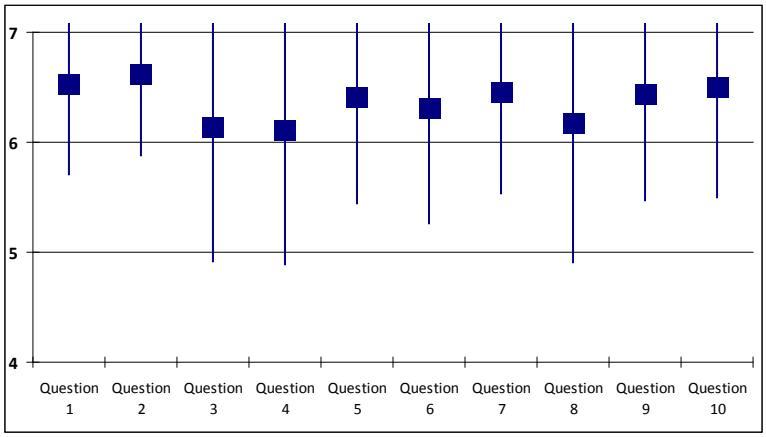

Fig. 1 - Average score per question on final questionnaire (avg. ± st.dev.).

One of the strong points of the S.O.S. Ulcer project was that the end users themselves were actually involved in creating the course. Facilities in the territory, which see numerous cases of patients affected by skin ulcers on a daily basis, were directly involved in every step of designing the program from evaluating training needs, strategies and targets, to the organizing and actual carrying out of the project.

The e-learning platform offered the possibility to provide the training course with the utmost flexibility, not only in terms of scheduling and time, but also in terms of space needed. It also allowed us to overcome organizational and bureaucratic obstacles and reach a wide number of participants. At this point, moving ahead, it will be crucial to monitor the level of quality of the training programs that this type of network that has been built can reach (Ghislandi, 2008).

The involvement of the nursing homes and residential facilities from the beginning helps explain the high participation rate among nurses and nurse assistants (even though the latter has absolutely no obligation by law to take CME courses), and also the low participation by doctors. Doctors in the Veneto region, in fact, only work in very limited numbers within these types of

facilities and are not directly employed by them.

In regards to the real user participation of the online course, about 50 % of the enabled users actually accessed the e-learning platform in the first year. When looking at this information, it must be taken into consideration that the users were signed up by the facilities, and not by themselves, in a period well before the official launch of the site. This means that in many cases, especially in the nursing homes where turnover is high, many people who were signed up did not take part in the course. This type of indicator will be monitored going forward. Among the users who accessed the course at least one time, 28% later abandoned their studies. We believe this value can be reduced further by increasing the organizational support network surrounding the course.

The project is scheduled to continue for a second and third year of e-learning study. At the same time, an evaluation of the effectiveness of the course has been planned in order to update the first observational study done back in 2007-2008. This will be of fundamental importance for measuring the actual impact the training has had on the quality of care and assistance received by patients affected by skin ulcers.

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