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The impact of a continuing training program on the perceived improvement in quality of health care delivered by health care professionals

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ABSTRACT

There is abundant scientific literature concerning factors that affect patients' perceptions of the quality of health care. However, there are few published works that consider the opinions of health care professionals. This article aims to conjointly analyse two organisational strategies that determine professional health care practice: continuous training and quality of care. The objective is to examine the opinions of physicians and nurses on the improvement of the quality of care after a 'learning by doing' program. An evaluation method was designed that integrates the main variables that intervene in quality of care. An online questionnaire was utilised for collecting opinions on the effects of the training program. A total of 184 nurses and 180 other medical professionals participated in the program and all of them were asked to complete the questionnaire. A descriptive, and inferential statistical analysis was undertaken and results showed that there is a direct relationship between perceptions about: satisfaction, professional competence, training modality, optimisation of health resources and quality of care.

1. Introduction

Continuous quality improvement in health systems has become one of the priorities of health policies (Cunningham, Ferguson-Hill, Matthews, & Bailie, 2016). Implementation requires organisational knowledge and the participation of the different agents involved. The new definition of clinical governance aims to ensure high quality care for patients based on best practices, transparency, continuing interprofessional education and a commitment to professional responsibility (Gordon & Campbell, 2013; Kasvosve et al., 2014; Reeves, 2009; Ruiz, 2004).

According to the World Health Organization (2006), the quality of care provided by health care system depends on each patient receiving the most appropriate set of diagnostic and therapeutic services to achieve optimal health care, taking into account the knowledge of the patient and the medical services. The best results are achieved with the minimum risk of iatrogenic effects and the maximum satisfaction of patients. Patient care should be: "effective, efficient, accessible, acceptable, patient-centred, equitable and safe" (WHO, 2006: 18–19). Quality of care can therefore be seen as a concept that is both complex and multidimensional.

Donabedian (1989) suggests that multidimensionality involves technical-scientific aspects, interpersonal relationships and other elements of the environment, comprising services, management, information and other support processes. The importance of interpersonal relationships is reflected in the consideration of the patient as an agent in the health service. Villegas and Rosa (2003) argue that addressing the concept of quality of care requires the assessment of the expectations and needs of patients, health professionals and health administrators.

In addition to the attributes of multidimensionality and complexity, the measurement of the quality of a health service must take into consideration the fact that the concept of 'quality' is intangible, heterogeneous and subjective: the methodologies and instruments employed must be adapted to the identification of the concept by those who evaluate it.

In recent years there has been an intense and progressive interest in measuring patient satisfaction. This is probably due to the transformation of the bioethical and legal bases for the participation of the patient in the health system. Patients are consulted on a variety of issues that include: results; processes; health and support services; and professional actions. Assessment has utilised specific models and tools, such as SERVQUAL 15 (Zeithaml, Parasuraman, & Berry, 1992), which uses a standard questionnaire that evaluates the quality of service through five dimensions: reliability, responsiveness, safety, empathy and tangible elements. This model is an instrument for the

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measurement of strategies for the improvement of a system.

Based on SERVQUAL 15, Hernán, Jiménez, March, & Silió (1996) developed the SERCAL questionnaire which also measures perceived quality of service on a 5 dimensional scale in health care institutions: accessibility, comfort, personalised care, safety and confidence.

As previously mentioned, in comparison to studies on patients' opinions of quality of care, there has been little published research on the perceptions of health professionals, although there have been some works that deal with primary or specialised care: Campbell, Silver, Sherbino, Ten Cate, and Holmboe (2010); Moore, Green, and Gallis (2009); Parchman et al. (2016), Sibthorpe and Gardner (2007). Some of these have compared the opinions of the professionals and the users. Hernán, Gutiérrez, Lineros, Ruiz, and Rabadán (2002), found that the perceptions of professionals on the quality of service are usually in line with those of the users. The results of this type of research can lead to important synergies for the design of processes, services and the continuous improvement of the health system.

The published literature usually refers to the satisfaction of professionals with regards to specific issues such as electronic prescription, specific treatments, professional quality of life, burnout and collaborative environments (Tilden, Eckstrom, & Dieckmann, 2016). The evaluation of the training of health care professionals is of particular importance (McKillop, Doughty, Atherfold, & Shaw, 2016; Overeem et al., 2007) and a number of studies have considered preferences concerning training modality (Kempkens, Dieterle, & Butzlaff, 2009) and satisfaction (Rego et al., 2009).

In general, training programs are not evaluated due to difficulties in measuring outcomes and the lack of an evaluation culture in health care systems (Medina et al., 2015). Nevertheless, evaluation represents a significant resource for developing management processes, dealing with the complexity of health care systems, improving competences, integrating technology and empowering the patient (Ruiz, 2004). Continuous training needs quality standards for assessing the impact of programs on professionals and organisations (Varo, 1994).

A variety of learning models have been successfully implemented with health care professionals (Esteban et al., 2015), examples include: Problem-based learning (Strohfeldt & Khutoryanskaya, 2015); Collaborative learning teams (Nadeem, Olin, Hill, Hoagwood, & Horwitz, 2014); Competency-based portfolios (Gordon & Campbell, 2013; McEwen, Griffiths, & Schultz, 2015); and Group-based learning (Wenghofer et al., 2014).

With regards to continuing training and satisfaction, a range of dimensions related to applicability and practice have been taken into account (Hildebrand et al., 2009).

'Learning by doing' is based on the work of Miller (1990). It refers to the definition and operationalisation of professional competences in the learning process. The acquisition or improvement of professional competence starts with 'knowing' (the learning of new knowledge, skills and abilities) and ends with 'demonstrating'.

Professional competence is developed with the application of what has been learned in the workplace, resulting in an organisational improvement (in the case of health systems this means an improvement in the quality of care). According to the scientific literature, this modality means that the participant learns more and better; it is a method that is only surpassed by individual instruction and it has been shown to be superior to traditional teaching practices (Van Dam, 2004, quoted in Fernández et al., 2012).

This article is an analysis of the perceptions of Aragonese health service professionals on the improvement in the quality of care after the implementation of a continuous training program based on the 'learning by doing' methodology. The program is aimed at developing professional skills and has been used by the Aragon public administration system since 2005. The study examines the opinions of the health service professionals on the effects of the training program in the centres in which they work. The objective is to provide information that will help answer the question of whether training strategies have an influence on professionals and the health organisation and can produce observable results in clinical practice.

2. Methods

2.1. Universe and sampling

There were 385 participants, comprising all the health professionals who underwent the training programs: physicians, auxiliary nurses, nurses, technicians, engineers, physiotherapists, psychologists, social workers and midwives. All were working for the Aragon health service in primary and specialist care. Two professional categories were selected: physicians and nurses; the other professional groups were excluded. The two categories represented 94.54% (364 people) of the total. As this was a statistically approachable number, it was decided that sampling was unnecessary; the research was therefore based on the complete study universe and this avoided the application of statistical inference techniques.

A total of 182 individuals completed the questionnaires (n = 364); a participation rate of 50%. According to Couper (2000, quoted in De Marchis, 2012), the average response rate to an email survey request is around 10%. From this we were able to infer that our response rate was very high and it showed a significant level of acceptance and collaboration with the program. Furthermore, there was a good balance between the professional categories and areas of work (see Table 1).

The mean age of the participants was 44.41 (95% CI: 43.17–45.66). 78.8% were women and 21.2% were men. The average number of years worked in the Aragonese health service was 17.54 (95% CI: 16.24–18.83).

2.2. Instrument: dimensions and variables

The instrument was based on the work of Miller (1990) and the operational strategies of the SERVQUAL and SERCAL questionnaires. The dimensions and variables concerned learning factors, training activity, organisation and quality of care.

The evaluation of the training program considered five dimensions that were assessed by the students: Socio-professional; Satisfaction; Training Modality; Improvement of Professional Competence; and Economic Impact. The Socio-professional dimension included the variables of: age; sex; work experience; profession and the number of training courses undertaken. The variables for the dimension of Satisfaction were: the instructor; content; time; and management. The Training Modality variables were: methodology; and knowledge retention. Improvement of Professional Competence variables were: the acquisition, application and transmission of knowledge/skills; and the

Table 1
Percentages of the Sample of Participants in the Study Universe, by Professional Categories and Area of Work.

	Universe N	Sample n	% Sample/Universe
Professional category			
Physician	180	77	42.78
Nurse	184	105	57.07
Area of Work			
Primary care	213	103	48.36
Specialist care	106	54	50.94
Emergencies (061)	45	25	55.56
Professional category/Area of Work			
Primary care physician	107	44	41.12
Specialist care physician	43	22	51.16
Primary care nurse	106	59	55.66
Specialist care nurse	63	32	50.79
Emergencies physician	20	11	55.00
Emergencies nurse	25	14	56.00
Total	364	182	50.00

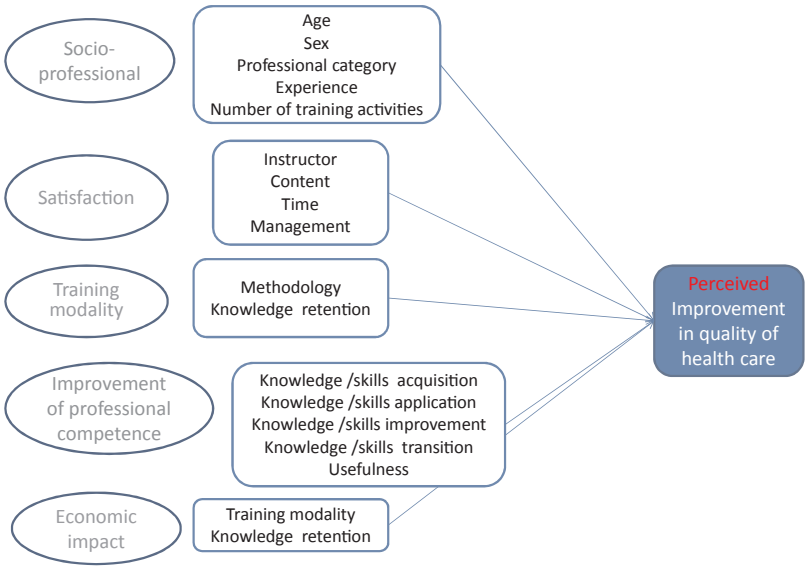

Fig. 1. Dimensions and Variables.

usefulness of the program. Economic Effect variables were: optimisation of resources; and the influence of training on spending. Finally, Improvement in Quality of Care was taken as a single, dichotomous variable. The relationship between the dimensions and variables is shown in Fig. 1.

2.3. Data collection

Data collection was by means of an online questionnaire that was sent out four months after the conclusion of the training program.

The questionnaire was anonymous and included an explanatory letter giving the reasons for the study and the advantages of participation. A period of ten days was allowed for completion and return.

Reliability was tested with Cronbach's alpha and the result was $\alpha = 0.76$. This is a high value that indicates the existence of good internal consistency between the elements. Validity was tested by means of a pilot study, undertaken by a panel of independent experts who concluded that the questionnaire was a useful instrument for measuring opinions on the training program.

3. Results

The scores for the variables were accumulated in accordance with their dimensions which gave a global value for each dimension. Results revealed a very positive evaluation of the training programs (Table 2).

95.7% of the respondents stated that they believed that the quality of health care had improved as a result of the training program.

Individual tests were conducted to examine the differences between groups in the perceived improvement in the quality of health care and the independent variables. The Chi-Square test was applied to show the relationship between the variables and was replaced by Fisher's exact test when the application criteria were not met. To compare means between independent groups, the U Mann-Whitney test was used for the two groups and the Kruskall Wallis test was used when the variable had more categories (Table 3).

Table 2
Global Scores for the Dimensions.

Dimension	Values (minimum-maximum)	Mean	Standard deviation
Satisfaction	–5	4.67	0.82
Training Modality	0 – 4	3.11	0.54
Improvement of Professional Competence	0 – 9	7.49	1.31
Economic Impact	0 – 3	1.25	1.11

Table 3
Statistical Differences between groups in Perceived Improvement in the Quality of Health Care and independent variables.

Variables	Test	p value
Sex	Fisher	0.633
Age	Fisher	0.713
Professional category	Fisher	0.700
Area of work	Chi square	0.993
Experience	Fisher	0.712
Number of training programs	Fisher	0.096
Satisfaction with training instructor	Fisher	0.003
Satisfaction with training content	Fisher	0.000
Satisfaction with training time	Fisher	0.027
Satisfaction with training management	Fisher	0.261
Satisfaction	Fisher	0.001
Training Modality	Fisher	–
Knowledge retention	Chi square	0.000
Knowledge acquisition	Chi square	0.000
Program utility	Chi square	0.233
Knowledge/skills application	Fisher	0.001
Knowledge/skills improvement	Fisher	0.000
Knowledge/skills transmission	Fisher	0.018
Optimisation of resources	Fisher	0.002
Influence on spending	Chi square	0.246

The level of statistical significance was set at $p \leq 0.05$. Mean and standard deviation values are given for the data frequencies.

The results showed that perceived improvement in the quality of care was related in a statistically significant manner to satisfaction with the training program instructors, program content, methodology and the duration (time) of the course. This relationship was also positive for retention, acquisition, application and the transmission of knowledge and skills. Participants in the training activities also responded positively to the interaction between improving quality of health care and optimizing health care resources.

There was no statistically significant relationship between improved quality of care and: gender, age, professional category, area of work, previous experience, training program activities, management, usefulness or influence on spending.

After the analysis of the independent variables, the next step was an analysis of the dimensions, with 'Perceived Improvement in the Quality of Health Care' considered as a dependent variable.

- Perceived Improvement of the Quality of Health Care and the

dimension 'Satisfaction'

The mean score for participants who were not satisfied with the training program and felt that there was no perceived improvement in the quality of health care was 2.83 (SD: 1.72); the mean for those who were satisfied and said that the quality of health care improved was 4.75 (DE: 0.66). The value p U of Mann Whitney ≤ 0.000 indicates the existence of significant differences between the means of the variables and Perceived Improvement in the Quality of Health Care (Care: p value 0.02).

- Perceived Improvement of the Quality of Health Care and the dimension 'Training Modality'

The result for Perceived Improvement in the Quality of Health Care in relation to the dimension of Training Modality was also statistically significant at p = 0.003. The mean score for participants who were not satisfied with the Training Modality and felt that there was no perceived improvement in the quality of health care was 2.25 (DE: 0.50). The mean for those who prioritised the Training Modality and said that the quality of health care improved was 3.15 (DE: 0.54)

- Perceived Improvement of the Quality of Health Care and the dimension 'Professional Competence'.

The mean score for participants who stated that the training program did not improve their professional competence or the quality of health care was 5.50 (DE: 2.07). The result for those who felt that there was an improvement in their professional competence and in the quality of health care was 7.70 (SD: 1.12). The difference was statistically significant (p = 0.007).

- Perceived Improvement of the Quality of Health Care and the dimension 'Economic Impact.

The mean score for those who felt that there was no improvement was 0.14 (SD: 0.38). The result for those who stated that quality of health care had increased was 1.34 (SD: 1.12). The difference was statistically significant (p = 0.001).

The analysis confirmed that the dependent variable, 'Perceived Improvement in the Quality of Health Care' was related to the other variables and dimensions. Participants who believed that the quality of health care improved because of the training program had higher average values in all dimensions.

For the purposes of this work, the dependent variable 'Perceived Improvement in Quality of Health Care' was considered as the final product and analysed in relation to the variables 'Application of Knowledge and Skills' and 'Improvement of Professional Competences'. The relationships were statistically significant: 98% of participants who stated that they had improved their professional competences and/or had applied the knowledge and skills learnt through the training program in their work also felt that the quality of health care that they were able to offer users had improved (Fig. 2).

The relationship between 'Application of Knowledge and Skills' and 'Perceived Improvement in Quality of Health Care' was confirmed in the previous analysis. From the total number of participants, those that were equally classified by the two variables was (4 + 146)/163 = 92.2%; in other words, 92.2% of the respondents were of the same opinion. Similarly, the relationship between the 'Improvement of Professional Competence' and the 'Perceived Improvement in Quality of Health Care' was confirmed: (4 + 147)/160 = 94.4%; which is to say that 94.4% of the participants were in agreement.

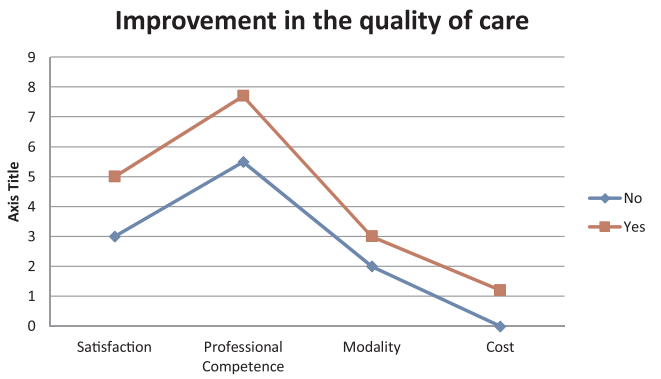

Fig. 2. Comparison of the Accumulated Mean Scores of the Variables in Relation to the Improvement in the Quality of Health Care.

The impact of the training program on the organisation was confirmed through the results for Perceived Improvement of the Quality of Health Care. The objective of the next phase was to formulate a predictive model from the logistic regression models. Because of the dependent variable, perceived improvement is dichotomous; all the logistic regressions are binary. The simple logistic regression result for all the variables was interpreted as an increase in the probability of improving the quality of health care by increasing the independent variable; for example, an increase in satisfaction would lead to an increase in the quality of health care, and this would be the case with all the independent variables. A multiple logistic regression model was applied to all the variables at the same time, with the objective of determining the probability of improving the quality of health care by adjusting for the remaining variables. The variables of the socio-professional dimension were not included because none of them were statistically significant in the analysis. The only significant variable was training modality; increasing the value of this dimension significantly increased the probability of improving the quality of health care. Despite the variability of the data and the amplitude of a 95% CI, the results obtained provide important information on the relationships (see Table 4).

4. Discussion

This article has presented an evaluation model in which perceived improvement in the quality of health care is considered as the final product of a training program undertaken by health care professionals. The model establishes a sequence of actions and connected effects that are produced by the independent variables, for example, satisfaction with the training program, the acquisition of the knowledge and skills that are transferred to occupational activities and the optimisation of resources. These issues contribute to the improvement of professional competence and the quality of health care.

When satisfaction with training programs increases so does the acquisition of knowledge and the perception of its usefulness for the professional: participants who felt that the training program had led to an improvement in their professional competence were more satisfied; this was also true of those that believed that they could apply the new knowledge and skills to their work.

The statistical analysis revealed a limited interdependence between the variables. Given its complex and multi-factorial nature, the study of quality of care requires the use of methodologies that exceed statistical significance and conform to the requirements of the terms.

In short, it appears that the training program variables that affect a perceived improvement in the quality of health care are interdependent

Table 4
Simple and multiple logistic regressions by Perceived Improvement in the Quality of Health care.

Independent variables	P	Simple logistic regression (IC95%)	P	Multiple logistic regression (IC95%)
Satisfaction	0.001	3.125 (1.602–6.095)	0.329	1.772 (0.562–5.588)
Training modality	0.006	25.802 (2.588–257.268)	0.034	16.479 (1.244–218.353)
Professional Competence	0.001	2.999 (1.603–5.612)	0.874	0.916 (0.310–218.353)
Economic Impact	0.019	12.744 (1.524–106.544)	0.161	7.174 (0.456–112.959)
Area under curve				0.930 (0.825–1.035)

among themselves, and, according to the proposed model, this interconnection generates an improvement. This seems logical when we take into account the fact that the most important properties of quality of care are multidimensionality and complexity.

5. Conclusion

The findings of this work support the previously published material on the advantages of continuous professional training among health professionals. A large proportion of health professionals' academic training is consolidated by work experience programs and residences (Headrick et al., 2016). The health system bases its training on precise protocols (Havyer et al., 2016) that are previously defined; the intervening agents are identified and the sequences of the processes are specified and this underlines the need to ensure genuine relationships between assessment and practice (Eva et al., 2016; Sweigart, Tad-y, Pierce,Wagner, & Glasheen, 2016).

This study has proposed and tested an operative evaluation model based on the SERVUAL and SERCAL questionnaires (Miller, 1990) and adapted to our specific health care context. The model is a first step in a process that is aimed at measuring the impact of learning strategies in health care organisations.

There should be a greater acceptance of the 'learning by doing' methodology. It is a training modality that allows for a dialogue between the instructors and the participants and the definition of actions through clinical and management protocols ensures predefined performance and learning quality.

It is clear that the training methodology is fundamental to a perceived improvement in the quality of health care (Weiner, Jackson, & Garten, 2009) and the results of this study support that assertion. An evaluation strategy is also vital in the training of public health workers (Compton, Baizarman, Preskill, Rieker, & Miner, 2001). Even though the costs involved might be seen as prohibitive, the data obtained in this study indicate that a functioning evaluation strategy can result in an optimisation of resources and an increase in the quality of health care.

Despite the fact that health professionals are able to provide valuable information on the improvement of quality of care, there are very few studies that consider their opinions. This research has attempted to take this valuable perception into account by directly considering the opinions of health care professionals. It is possible that their opinions may be different to other agents, so this study opens future research lines devoted to the examination of the extent to which continuing training influences the quality of care offered by health centres and hospitals. This would necessitate the design of models that analyse multidimensional concepts and allow the triangulation of results among the groups involved: patients, professionals and administrators (Harkanen, Voutilainen, Turunen, & Vehvilainen-Julkunen, 2016).

Similarly, the quasi–experiment design of this study could be improved by contemplating pre-intervention measures and control systems. Reliability of the instruments could be evaluated with an alternative approach, such as, for example, Tarkkoneńs rho.

This present work can therefore be seen as a precursor to more detailed research on the relationship between continuous training and the quality of health care.

6. Lessons learned

The results of this study indicate that when health professionals are satisfied with training programs and feel that they can apply the new knowledge that they have acquired, they tend to believe that they have improved their professional competence and the quality of health care that they can provide. The training modality is a determining variable in this relationship. 'Learning by doing' is an interesting training strategy for health care professionals because of its emphasis on the application of knowledge and transferability.

Evaluation of training programs is extremely important; the health care sector is a complex system which requires research on the results of such programs. The training program analysed in this article requires both a local and global interpretation: the results are taken from a local context but the lessons learned have a global objective − the perceived improvement in the quality of health care. Research and evaluation can provide information for decision making that is based on quality and evidence.

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