

**Changes in nurse outcomes after a BPSO® program implementation in the Spanish Health Context**

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**Title:**

Changes in nurse job outcomes after four years of a Best Practice Spotlight Organization® program implementation in the Spanish National Health Context

**ABSTRACT**

**Aim:** To evaluate the changes produced after the application of the BPSO® Program on the attitude towards the Evidence-based-Practice, the nurses' perception of the organizational climate and nurse outcomes in a health area of the Spanish National Health System.

**Background:** There is limited research that associates strategies of Evidence-based-Practice implementation with changes on the work environment and nurse outcomes.

**Methods:** Cross-sectional study that compared data on the nurses' perception of the work environment. Five guidelines were implemented between 2012-2015 in a health area. Data were collected in 2012 and 2016/2017, using a questionnaire consisting of 5 previously-validated tools. X<sup>2</sup>, t-test, ANOVA, and multivariate analysis were carried out.

**Results:** A total of 451 nurses participated. Compared with the baseline evaluation in 2012, several outcomes changed significantly ( $p < 0.001$ ), nurses were younger and were more satisfied with "salary", "annual leaves" and "sick leave". The rest of the nurse outcomes were not modified.

**Conclusions:** Nurses' perception of the work environment is favorable, although the application of the BPSO® Program has not produced any major changes.

**Implications for Nursing Management:** Measures are suggested that are oriented towards the planning of staffing and the increase in the participation of the nursing staff in programs of implementation of guidelines.

**Keywords:** organizational climate, job satisfaction, quality of care, patient safety, clinical practice guideline, BPSO

## INTRODUCTION

Healthcare organizations that want to attain benchmarks of excellence should adopt models of transferring knowledge to clinical practice that promote Evidence-based Practice (EBP) (Curran et al., 2011). Findings from extensive research show that EBP use decreases clinical practice variation, improves the quality and safety of healthcare, enhances patient outcomes, and reduces costs (Melnik, 2016a). EBP implementation is a complex process, and numerous theoretical approaches have been defined which allow for the understanding and provide an explanation of the relationship between the factors that intervene in these EBP processes (Nilsen, 2020). The Consolidated Framework For Implementation Research (CFIR) offers an overarching typology composed of five major domains that comprise the most common constructs from published implementation theories: 1) *intervention characteristics*, often complex and multi-faceted, with many interacting components; 2) *outer setting*, includes the economic, political, and social context within which an organization resides; 3) *inner setting*, includes features of structural, political, cultural and organizational contexts through which the implementation process will proceed, 4) *characteristics of the individuals involved with the implementation*, and 5) *the process of implementation*, an interrelated series of sub-processes that often progress simultaneously at multiple levels within the organization (Damschroder et al., 2009).

Research on health services has shown the importance of the inner setting and the attributes that comprise them, and observations have been made that healthier and favorable work environments lead to more satisfied nurses, resulting in better job performance and higher quality of patient care (Wei et al., 2018). Factors such as leadership support, communication, teamwork collaboration, inter-organizational collaboration, and networks have been positively associated with nurse outcomes such as

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3 quality of nursing care, safety, and staff satisfaction (Kenaszchuk et al., 2010; Kilner &  
4 Sheppard, 2010). At the same time, these factors favor the implementation of evidence  
5 (Li et al., 2018; Ploeg et al., 2007). But the number of works that have studied this  
6 relationship directly are scarce. The studies conducted until now indicate that diverse  
7 strategies of EBP implementation or with components related to EBP produce positive  
8 changes on the nurses' attitude towards EBP, as well as their perception on the preparation  
9 of the work environment or the EBP (Melnik et al., 2017; Warren et al., 2016). Also, an  
10 EBP mentorship program had positive effects on the nurses' EBP beliefs and EBP  
11 implementation, and also on their level of job satisfaction, group cohesion, and intent to  
12 stay in their organization (Wallen et al., 2010).

### 23 24 25 **Contextualization**

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28 In the last few years, there has been a great interest in healthcare organizations on  
29 the implementation of clinical practice guidelines (CPGs) as facilitators for the  
30 application of research-based knowledge in clinical practice (Shekelle et al., 2012). The  
31 Best Practice Spotlight Organizations® (BPSO®) Program is an initiative that started in  
32 Canada in 2003 by the Registered Nurses' Association of Ontario (RNAO) which aims  
33 to disseminate, pilot and evaluate CPGs oriented towards health care. In 2010, the RNAO  
34 and the Nursing and Healthcare Research Unit, Institute of Health Carlos III (Investén-  
35 isciiii) from the Spanish Ministry of Science and Innovation, signed a collaboration  
36 agreement for the replication of the program in Spain, where Investén-isciii took on the  
37 responsibility for coordinating the implementation of the program as the BPSO® Host  
38 (González-María et al., 2020). There are currently 27 institutions in Spain of different  
39 characteristics that implement a total of 20 clinical practice guidelines.

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42 The present study was carried out in one of these institutions after the  
43 implementation of the BPSO® Program between 2012-2015 in a health area in Spain.  
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45 The Consolidated Framework for Implementation Research (CFIR) may serve as an  
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3 appropriate framework with which to show the factors involved in the study and their  
4 relationships (Figure 1). The BPSO® Program, (intervention) is a project where the health  
5 and academic institutions that are interested in the implementation of CPGs from the  
6 RNAO are selected in a competitive process. The centers are mentored and audited by  
7 the BPSO® Host, and after 3 years of implementation of the GPCs and the compliance  
8 of the criteria established by the program, formalize new agreements as designated  
9 BPSO® centers. The project involves the application of 5 GPCs using the Knowledge-  
10 to-Action framework (Graham et al., 2006) which establishes a cycle of 6 phases  
11 (implementation process). The implementation is conducted in a specific health area of  
12 the Spanish National Health Service (outer setting) and changes and adaptations are  
13 introduced on the policies of the organization as well as organizational aspects to facilitate  
14 the implementation of the GPCs (inner setting). Throughout the entire process, managers,  
15 middle managers, front-line nurses, and other professionals from the organization  
16 participate, receiving training and becoming involved in the implementation activities  
17 (individuals).

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Qualitative research studies conducted with nurses who have directly participated  
in the implementation of various CPGs using the BPSO® program point out that the  
professionals perceive changes in their work environment and their role responsibilities,  
indicating that they find themselves more satisfied with the work they perform and feel  
that they provide higher quality care (Ramos-Morcillo et al., 2020; Ritchie & Prentice,  
2011). However, it is unknown if, in a general manner, the application of CPGs  
implementation programs such as the BPSO® Program favor positive environments that  
result in a better perception of their work environment and better nurse outcomes.

Thus, the main objective of the study was to evaluate the changes produced after  
the application of the BPSO® Program in the attitude towards EBP, the nurses'  
perception of the organizational climate, job satisfaction, patient safety, and quality of

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3 care in an area of health of the Spanish National Health System. As a secondary objective,  
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5 the relationship between the socio-occupational variables and the work environment to  
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7 their attitude towards the EBP, job satisfaction, quality of the care, and patient safety,  
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9 were evaluated.  
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## 11 **METHODS**

### 12 **Design and setting**

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16 A cross-sectional observational study was performed to compare nurse outcomes in a  
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18 health area of the Spanish National Health System (SNHS) in 2012 and 2016/17. During  
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20 the 2012-2015 period, the BPSO® Program was implemented in a medium-sized  
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22 University Hospital with 286 beds, and 10 primary care health centers attached to a health  
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24 area of the SNHS. Five CPGs were implemented: Ostomy Care and Management,  
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26 Assessment and Management of Pain, Breastfeeding, Developing and Sustaining Nursing  
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28 Leadership, and Professionalism in Nursing. Diverse hospital care units and Primary Care  
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30 centers participated in the implementation of the CPGs (Table 1. Supplemental material).  
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32 The health area was accredited as a BPSO® in 2015 and is still working on the  
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34 sustainability phase. During this phase, the BPSO® Host continues supporting and  
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36 mentoring the centers through audits and reports, the implementation activities are  
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38 updated in a constant cycle of identification of barriers, and the addition of new  
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40 collaborators, the collection of indicators of health results of the implemented guides, the  
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42 training of the professionals, and the dissemination of results and advances achieved, are  
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44 maintained.  
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### 50 **Participants**

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52 The study population was comprised of registered nurses who worked in the health area  
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54 of the SNHS, with any type of contract, and in active service when the study was  
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56 conducted. A total of 363 nurses in 2012 (252 registered nurses at the hospital, and 111  
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58 registered nurses in primary care) and 368 in 2016/17 (255 at the hospital and 113 in  
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3 primary care), were included in the study. The distribution of the nursing staff in 2017,  
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5 according to the units where the 5 CPGs were implemented, is shown in table 1  
6  
7 (supplemental material).  
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### 9 **Variables and instruments**

10 A questionnaire was created which consisted of 4 blocks:

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12 a) Socio-demographic data: age, gender, employment status, healthcare setting, years of  
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14 working experience, type of contract, type of shift, and continuous training and training  
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16 on EBP.  
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20 b) Attitude towards EBP with the Evidence-Based Nursing Attitude Questionnaire  
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22 (EBNAQ), validated in the Spanish context (Ruzafa-Martínez et al., 2011). It is composed  
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24 of 15 items grouped into 3 dimensions: beliefs and expectations, the intention of conduct,  
25  
26 and feelings towards the EBP. The scale ranges from 1 “negative attitude” to 5 “positive  
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28 attitude”.  
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32 c) Organizational climate: an adapted and validated questionnaire was applied (Chiang  
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34 Vega et al., 2008), composed of 42 items, which measured the dimensions of the  
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36 organizational climate: Autonomy, Cohesion, Trust, Support, Recognition, Fairness,  
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38 Innovation, and Pressure. The scale ranged from 1 “negative climate” and 5 “positive  
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40 climate”.  
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44 d) The variables relative to the nurse outcomes have been utilized in an international study  
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46 conducted in 12 European countries, and all of these tools had been previously validated  
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48 in Spanish (Sermeus et al., 2011): Job satisfaction (13 items, response range between 1  
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50 “very dissatisfied” and 4 “very satisfied”), Quality of nursing care (4 items, one with a  
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52 Likert response scale with 3 options, and 3 items with a Likert response scale with 4  
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54 options) and Patient safety (7 items, response range between 1 "strongly disagree " and 5  
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56 "strongly agree").  
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### 60 **Data collection process**

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3 The data from the nurses was collected on two occasions during the study through an  
4 anonymous and self-completed questionnaire. The initial period (P0), before starting the  
5 BPSO® program implementation, between Jan-April 2012, and in the second period (P1)  
6 between November 2016 and February 2017. The unit charge nurses and the health center  
7 coordinators were in charge of distributing and collecting the questionnaires to and from  
8 the professionals, and after two weeks and a month, they provided reminders to increase  
9 participation.

### 18 **Ethical considerations**

20 The study was approved by the Research Committee from the Health Area III from the  
21 Autonomous Community of Murcia (2013/0401). The participants were informed about  
22 the objective of the study. The completion of the questionnaire was considered as consent  
23 for participating in the study.

### 29 **Data analysis**

31 A descriptive analysis was carried out, the means and standard deviations (SD) were  
32 calculated for continuous variables, and the absolute and relative frequency distributions  
33 were calculated for categorical variables. To compare the socio-occupational variables  
34 and the main outcomes evaluated in P0 and P1, the Chi-square test was utilized for  
35 proportion comparison, and the Student's t-test and one-way ANOVA for the comparison  
36 of independent means. Also, to control against possible confounding factors, a General  
37 Linear Model (GLM) was carried out for each of the nurse outcomes studied. Each  
38 analysis included the nurse outcomes as a dependent variable, the period studied (P0 / P1)  
39 as an independent variable, controlling for the sociodemographic variables that were  
40 statistically significant different between periods: healthcare setting (hospital / primary  
41 care setting), employment status (staff, intern and substitute), and age. The GLM results  
42 are provided when statistically significant differences were found. For the multivariate  
43 analysis, the attitude towards EBP, job satisfaction, quality of care, and patient safety



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3 were re-codified into dichotomous variables. The results are shown as Odds Ratios (OR)  
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5 and their respective confidence intervals at 95%. All the analyses were conducted at the  
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7 individual nurse level for all variables. All the results were considered statistically  
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9 significant at  $p < 0.05$ . The data were analyzed with the SPSS statistical package version  
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11 26.0 (IBM SPSS, Chicago, IL, USA).  
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## 13 14 **RESULTS**

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16 A total of 451 nurses participated in the study, 219 before the implementation of the  
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18 BPSO® program in 2012 (P0), with a response rate of 60.33%, and 232 nurses in the  
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20 second period (P1) in 2016/2017, with a response rate of 63.04%. The nurse turnover rate  
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22 in both periods was 20%.  
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25 In both measurements, almost 75% of the nurses were women and were significantly  
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27 younger and with less work experience in P1. As for their employment status, more than  
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29 half were permanent staff at the Regional Health Service, with a significantly greater  
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31 proportion of temporary contracts observed in P1. No differences were found on the type  
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33 of contract or training in general and on the EBP in the last two years. On the contrary,  
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35 statistically significant differences were observed in the type of work shift, mainly in the  
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37 fixed afternoon shifts, and the rotating 8 hours shift (Table 2).  
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41 A positive attitude towards EBP was observed with values higher than 3.5 in the three  
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43 scale dimensions and without statistically significant differences between the periods  
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45 compared. The mean scores for the dimension “beliefs and expectations” were: P0=4.02;  
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47 Standard deviation (SD)=0.5 vs P1=4.00; SD=0.5 ( $p=0.7$ ), for “intention of conduct”  
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49 P0=3.74, SD=0.6 vs P1=3.63; SD=0.6 ( $p=0.05$ ) and for “feelings” P0=3.90; SD=0.6 vs  
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51 P1=3.88; SD=0.6 ( $p=0.64$ ). Lastly, the mean scores for “overall attitude” were P0=3.90;  
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53 SD=0.5 vs P1=3.85, SD=0.5 ( $p=0.32$ ). The perception of the nurses on the organizational  
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55 climate did not show significant differences after the implementation of the program in  
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57 any of the 8 dimensions evaluated. The dimensions “recognition” and “pressure” received  
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3 the lowest scores, while the dimensions “trust” and “support” were the best scored in both  
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5 periods studied (Table 3. supplemental material).  
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7 Almost 76% of the nurses in P0 and 82% in P1 indicated being moderately/very  
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9 satisfied with the present job, with the differences not being statistically significant (Chi-  
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11 square 4.24;  $p=0.23$ ). The “human resources” were poorly evaluated in both periods,  
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13 while the best evaluated was the “peer relationship” (Table 4). However, the differences  
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15 found were not statistically significant in any of the aspects of satisfaction measured. As  
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17 for the degree of satisfaction with the work conditions, it was observed that nurses were  
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19 more satisfied in the second period with the “salary”, the “annual leaves” and the “sick  
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21 leave”, with these differences being statistically significant. The other dimensions did not  
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23 show statistically significant differences (Table 4).  
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28 As for the quality of nursing care (Table 5), statistically, significant differences were  
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30 not found between the periods compared. In general, the nurses believed that the quality  
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32 of care in their respective centers was good/excellent, and approximately 3 out of 4 nurses  
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34 in both measurements considered that the quality of care was the same in the last year.  
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36 No statistically significant differences were found in relation to the evaluation of patient  
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38 safety, with 90% of the nurses indicating that it was between acceptable and very good  
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40 (Table 5). Nevertheless, there was a significant increase of nurses in P1 who were in  
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42 agreement with the “feeling that the errors were utilized against them”, (Table 6),  
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44 although in the GLM analysis performed for controlling against the confounding factors,  
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46 this association disappears ( $F= 0.40$ ;  $p=0.52$ ) and is associated with age ( $F=6.31$ ;  
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48  $p=0.012$ ) and employment status ( $F=4.28$ ;  $p=0.014$ ).  
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53 Lastly, Table 7 shows the results of the multivariate analysis and details the results of  
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55 the socio-occupational variables, organizational climate, and job satisfaction, which show  
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57 statistically significant associations with the attitude towards EBP, overall job  
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3 satisfaction, quality of care in their center, and general perception of patient safety in the  
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5 two periods studied.  
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## 7 **DISCUSSION**

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9 This research study aimed to evaluate the changes produced after the application  
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11 of the BPSO® Program in the attitude towards EBP, the nurses' perception of the  
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13 organizational climate, job satisfaction, patient safety, and quality of care in an area of  
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15 health of the Spanish National Health System (SNHS). In general, our findings do not  
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17 show significant changes after the implementation of 5 CPGs following the BPSO®  
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19 Program. However, the changes in the organizational culture have been shown to be  
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21 produced slowly, during a period lasting between 5-10 years (Melnyk, 2016b). Other  
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23 studies that have utilized other models of EBP implementation and in a community health  
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25 setting did not show differences in the job satisfaction and group cohesion either, although  
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27 improvements were observed in the beliefs and implementation of the EBP (Levin et al.,  
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29 2011). Another study showed ambivalent results, reporting improvements in the attitude  
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31 towards the EBP of clinical nurses, but not of nurse leaders, without changes shown in  
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33 the implementation of the EBP (Warren et al., 2016).  
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39 In both periods studied, the nurses demonstrated to have a favorable attitude  
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41 towards EBP in line with other studies (Ruzafa-Martínez et al., 2011; Saunders et al.,  
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43 2016), and this was associated with having been trained in EBP and with innovation and  
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45 satisfaction with the physical resources. As in previous studies (Chiang Vega, Salazar  
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47 Botello, Martín Rodrigo, & Núñez Partido, 2011; Blinded, 2019), the nurses evaluated  
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49 their work environment in a considerably positive manner. They referred to an adequate  
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51 organizational climate in all the dimensions analyzed, positively highlighting “trust” and  
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53 “support”, and approximately 3 out of 4 nurses mentioned being satisfied with the current  
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55 job, with the “peer relationship” and “support from the supervisor/coordinator” being the  
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57 best evaluated aspects. Also, about 70% of the nurses considered that patient safety was  
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3 a priority for the organization and about 80% stated that the quality of care in their center  
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5 was between good and excellent, with these data being generally better than those  
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7 obtained in other countries (Aiken et al., 2012). At the same time, the multivariate results  
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9 showed that the variables “cohesion”, “support”, “peer relationship”, “adequacy of  
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11 resources and personnel”, and “opportunities for professional development” had positive  
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13 associations with job satisfaction and the perception of safety and quality of care. As  
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15 shown, all of these factors are key job resources specific to the nursing staff, so that  
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17 promoting them would improve their perception of the work environment (Broetje et al.,  
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19 2020). At the same time, these findings reveal the importance of relationships, cohesion,  
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21 and support for nurses, suggesting that an EBP mentorship initiative could have a positive  
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23 effect within the BPSO® program.  
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28 On the other hand, our findings only showed significant changes in the increase  
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30 of satisfaction for the “salary”, “annual leaves” and “sick leave”. This could be explained  
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32 by the changes and cuts performed to the workers’ benefits due to the economic crisis  
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34 experienced by the NHS in Spain between 2009 and 2013, which were progressively  
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36 recovered starting in 2015. These changes included an increase in the work hours from  
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38 35 to 37.5 hours per week, reduction of non-working days, a decrease of staff, a decrease  
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40 in the economic benefits of time off work, and the suspension of payment for extra time  
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42 worked. However, a study that compared two samples of nurses before and after the  
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44 economic crisis in Spain found contrary results. After the crisis, the nurses were more  
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46 satisfied with their current work, perceived a more favorable work setting, and had lower  
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48 levels of exhaustion (Esteban-Sepúlveda et al., 2019).  
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53 Also, the results showed an increase in the perception that mistakes are utilized  
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55 against healthcare professionals. However, after controlling for confounding variables, it  
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57 was observed that this effect is explained by the differences in the characteristics of the  
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59 healthcare professionals from both measurements. In the second measurement, the nurses  
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3 were 7 years younger on average and a greater number had a temporary contract in the  
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5 healthcare services. These differences are possibly due to the high turnover rates found,  
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7 linked to the process of work transfer that allows the health professionals to change their  
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9 place of work as a function of their seniority within the NHS, which has entailed the  
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11 departure of part of the professionals with more experience and the addition of younger  
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13 health professionals who come from less-favorable work conditions. As previous studies  
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15 have indicated, this high nurse turnover could decrease the performance of the investment  
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17 in the human capital of the organizations (Hayes et al., 2012) and could limit the effect  
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19 of the CPGs implementation program, which could explain why the nurse outcomes have  
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21 remained stable through time, as it shifts to the starting point before the implementation  
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23 of the CPGs. **The BPSO® has medium-term goals, therefore, more efforts should be made**  
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25 **on staffing planning, where having permanent, full-time nurses could be a key factor.**  
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31 The multivariate analysis results point towards this idea, as in the second  
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33 measurement, having a temporary contract and work pressure were associated with work  
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35 dissatisfaction. The pressure was also associated with a poor perception of the quality of  
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37 care and patient safety. Both aspects have been linked to younger worker profiles and  
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39 with less work experience (Yang et al., 2017). Previous studies have pointed out that work  
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41 insecurity, independent of the salary, affects the satisfaction with the work (Han et al.,  
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43 2009). On the other hand, work pressure is perceived when less time is available to  
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45 perform all the tasks needed for the care of a patient, increasing care left undone and  
46  
47 worsening the quality of care (Smith et al., 2020). **It seems that younger and less**  
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49 **experienced nurses require specific actions, and management innovations such as GPC**  
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51 **implementation programs could be an opportunity for obtaining their commitment to the**  
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53 **institution.**  
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58 Limitations of the study  
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3 The characteristics of a cross-sectional study limit the ability for establishing  
4 causal relationships. Also, the role of the hospital professionals in the implementation of  
5 each GPC was unknown, and has not allowed ascertaining if the involvement of the  
6 hospital professionals in the BPSO program has any influence on the perception of the  
7 workplace. Also, the use of self-reported questionnaires to evaluate the nurses' outcomes  
8 could overestimate the findings.  
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16 Finally, due to the complexity of the health services, it would be advisable to  
17 perform longitudinal studies or studies with a control group and the triangulation with  
18 qualitative studies that delve into aspects that escape the dimensions included in the  
19 questionnaires that are commonly utilized.  
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## 25 CONCLUSIONS

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28 In the period studied, the application of the BPSO® Program did not produce  
29 significant changes on the nurses as related to their attitude toward EBP, their perception  
30 of the organizational climate, job satisfaction, patient safety, and quality of care, and  
31 changes were only produced for a better perception of some aspects related with work  
32 conditions. Despite this, the perception of the nurses about their work environment and  
33 nurse job outcomes is favorable and is positively related to an organizational climate  
34 based on trust and support, so that the nurses were more satisfied with the resources,  
35 staffing, and the opportunities for professional development. On the other hand, having a  
36 short-term contract and work pressure increased job dissatisfaction.  
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## 48 IMPLICATIONS FOR NURSING MANAGEMENT

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51 The implementation of the CPGs served the managers as a strategy of innovation  
52 in their organizations, and the findings provide interesting results. A critical aspect of the  
53 application of these programs is the planning of staffing, so that there should be a trend  
54 of the permanent hiring of professionals. There is a need to adapt the staff to the needs of  
55 the units and to try to find an equilibrium between experienced and non-experienced  
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professionals. At the same time, permanent training programs on the implementation of guides and programmed feedback strategies should be established in all the units to promote a climate of cohesion within the organization. Also, these activities could serve to establish professional promotion systems, by involving the more experienced professionals and facilitating the training and collaboration in pairs. Lastly, the organizational support should be promoted, by establishing communication lines between nurse managers and frontline nurses, where the professionals could express their concerns.

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**Table 2: Sociodemographic and labor characteristics of the nurses in both periods (P0 n=219; P1 n=232)**

VARIABLES	P0 (2012)	P1 (2016/17)
	Mean (SD)	Mean (SD)
Age, years **	46.70 (9.2)	43.23 (8.7)
Work experience, years	17.84 (9.0)	16.92 (9.2)
Work experience health area, years	10.89 (8.2)	11.06 (7.9)
	n (%)	n (%)
<b>Gender</b>		
Male	60 (25.0)	62 (25.8)
Female	159 (75.0)	170 (74.2)
<b>Healthcare setting**</b>		
Hospital	144 (65.8)	185 (79.8)
Primary care	75 (34.2)	47 (20.2)
<b>Employment status*</b>		
Staff	136 (63.6)	120 (52.2)
Intern	45 (21.0)	54 (23.5)
Temporary substitute	33 (15.4)	46 (24.3)
<b>Type of contract</b>		
Full-time	203 (94.4)	209 (90.5)
Part-time	16 (5.6)	23 (9.0)
<b>Work Shift*</b>		
Mornings	91 (42.7)	90 (39.0)
Afternoons	15 (7.0)	2 (0.9)
Rotating 8h	36 (16.9)	51 (22.1)
12h shift	4 (1.9)	6 (2.6)
17h shift	37 (17.4)	46 (19.9)
Fixed 24 horas	14 (6.6)	10 (4.3)
Other	16 (7.5)	26 (11.2)
<b>Continuous training last 2 years</b>		
None	28 (13.0)	24 (10.3)
< 50 hours	95 (44.2)	86 (37.1)
51 - 120 hours	54 (25.1)	62 (26.7)
> 120 horas	38 (17.7)	60 (25.9)
<b>EBP training in the last 2 years</b>		
None	112 (53.3)	123 (53.2)
< 50 hours	76 (36.2)	78 (33.8)
51 - 120 hours	16 (7.6)	21 (9.1)
> 120 horas	6 (2.9)	9 (3.9)

SD: Standard deviation; \*p<0.05; \*\*p<0.001; P0=data from 2012; P1= data from 2016/17

**Table 4. Comparison of the satisfaction with the work environment according to the period measured (P0 n=219; P1 n=232)**

		Poor n (%)	Acceptable n (%)	Good n (%)	Excellent n (%)	p
<b>Staffing</b>						
	<b>P0</b>	38 (17.7)	116 (54.0)	48 (22.3)	13 (6.0)	0.07
	<b>P1</b>	31 (13.4)	125 (54.1)	71 (30.7)	4 (1.7)	
<b>Resources</b>						
	<b>P0</b>	40 (18.6)	102 (47.4)	62 (28.8)	11 (5.1)	0.07
	<b>P1</b>	31 (13.4)	125 (54.1)	71 (30.7)	4 (1.7)	
<b>Peer Relationship</b>						
	<b>P0</b>	2 (0.9)	25 (11.6)	120 (55.6)	69 (31.9)	0.52
	<b>P1</b>	0 (0.0)	27 (11.6)	127 (54.7)	78 (33.6)	
<b>Support supervisor/ Coordinator</b>						
	<b>P0</b>	4 (1.9)	32 (14.8)	105 (48.6)	75 (34.7)	0.25
	<b>P1</b>	9 (3.9)	28 (12.1)	127 (54.7)	68 (29.3)	
		Dissatisfied n (%)	Somewhat satisfied n (%)	Moderately satisfied n (%)	Very satisfied n (%)	p
<b>Work schedule flexibility</b>						
	<b>P0</b>	16 (7.5)	27 (12.6)	124 (57.9)	47 (22.0)	0.29
	<b>P1</b>	8 (3.4)	33 (14.2)	127 (59.1)	54 (23.3)	
<b>Professional development</b>						
	<b>P0</b>	20 (9.3)	57 (26.6)	107 (50.0)	30 (14.0)	0.08
	<b>P1</b>	8 (3.5)	69 (29.9)	121 (52.4)	33 (14.3)	
<b>Autonomy at work</b>						
	<b>P0</b>	5 (2.3)	34 (15.8)	139 (64.7)	37 (17.2)	0.43
	<b>P1</b>	7 (3.0)	27 (11.6)	148 (63.8)	50 (21.6)	
<b>Professional status</b>						
	<b>P0</b>	12 (5.6)	32 (15.0)	140 (65.4)	30 (14.0)	0.25
	<b>P1</b>	6 (2.6)	31 (13.4)	151 (65.4)	43 (18.6)	
<b>Salary</b>						
	<b>P0</b>	55 (25.2)	73 (33.5)	78 (35.8)	12 (5.5)	<0.001
	<b>P1</b>	21 (9.1)	63 (27.2)	127 (54.7)	21 (9.1)	
<b>Training opportunities</b>						
	<b>P0</b>	23 (10.6)	59 (27.1)	109 (50.0)	27 (12.2)	0.54
	<b>P1</b>	17 (7.4)	73 (31.7)	112 (48.7)	28 (12.4)	
<b>Annual leave</b>						
	<b>P0</b>	22 (10.2)	54 (25.0)	108 (50.0)	32 (14.8)	0.04
	<b>P1</b>	11 (4.8)	44 (19.0)	134 (58.0)	42 (18.2)	
<b>Sick leave</b>						
	<b>P0</b>	78 (36.1)	57 (26.4)	59 (27.3)	22 (10.2)	<0.001
	<b>P1</b>	35 (15.1)	59 (25.4)	112 (48.3)	26 (11.2)	
<b>Study leave</b>						
	<b>P0</b>	54 (26.2)	55 (26.7)	78 (37.9)	19 (9.2)	0.05
	<b>P1</b>	38 (16.7)	70 (30.7)	104 (45.6)	16 (7.0)	

P0=data from 2012; P1= data from 2016/17 **Note: GLM analysis controlling against confounding variables: healthcare setting (hospital / primary care), employment status, and age, did not show statistically significant differences.**

**Table 5. Comparison of the perception of the quality of care in both periods (P0 n=219; P1 n=232)**

		<b>Poor n (%)</b>	<b>Acceptable n (%)</b>	<b>Good n (%)</b>	<b>Excellent n (%)</b>	<b>p</b>
<b>Quality of care at institution</b>						
	<b>P0</b>	1 (0.5)	47 (21.8)	132 (61.1)	36 (16.4)	
	<b>P1</b>	5 (2.2)	47 (20.3)	155 (67.1)	24 (10.4)	0.09
<b>Quality of care in last year</b>		<b>It has deteriorated n (%)</b>	<b>It has been maintained n (%)</b>	<b>It has improved n (%)</b>		
	<b>P0</b>	52 (24.3)	106 (49.5)	56 (26.2)		
	<b>P1</b>	52 (22.4)	117 (50.4)	63 (27.2)		0.89
<b>Manage their self-care after discharge</b>		<b>Not confident n (%)</b>	<b>Somewhat confident n (%)</b>	<b>Confident n (%)</b>	<b>Very confident n (%)</b>	
	<b>P0</b>	8 (3.8)	10 (47.8)	86 (41.1)	15 (7.2)	
	<b>P1</b>	17 (7.4)	110 (47.6)	98 (42.4)	6 (2.6)	0.06
<b>The hospital will solve notified problems</b>						
	<b>P0</b>	32 (14.9)	100 (46.5)	73 (34.0)	10 (4.7)	
	<b>P1</b>	40 (17.5)	109 (47.6)	73 (31.9)	7 (3.1)	0.71
<b>Assessment of patient safety</b>		<b>Poor n (%)</b>	<b>Acceptable n (%)</b>	<b>Very good n (%)</b>	<b>Excellent n (%)</b>	
	<b>P0</b>	7 (3.3)	107 (49.8)	86 (40.0)	15 (7.0)	
	<b>P1</b>	8 (3.5)	121 (52.4)	91 (39.4)	11 (4.8)	0.84

P0=data from 2012; P1= data from 2016/17 **Note: GLM analysis controlling against confounding variables: healthcare setting (hospital / primary care), employment status, and age, did not show statistically significant differences.**

**Table 6. Comparison of the health professionals about aspects related to patient safety in both periods (P0 n=219; P1 n=232)**

		<b>Strongly disagree n (%)</b>	<b>Disagree n (%)</b>	<b>Indifferent n (%)</b>	<b>Agree n (%)</b>	<b>Strongly agree n (%)</b>	<b>p</b>
<b>Errors are used against</b>							
	<b>P0</b>	28 (13.2)	88 (41.5)	45 (21.2)	44 (20.8)	7 (3.3)	0.03
	<b>P1</b>	12 (5.2)	89 (38.7)	63 (21.4)	58 (25.2)	8 (3.5)	
<b>Shifts-information is lost</b>							
	<b>P0</b>	25 (11.9)	107 (51.0)	27 (12.9)	46 (21.9)	5 (2.4)	0.28
	<b>P1</b>	15 (6.5)	117 (50.4)	39 (16.8)	56 (24.1)	5 (2.2)	
<b>Transfers-information is lost</b>							
	<b>P0</b>	18 (8.5)	73 (34.3)	32 (15.0)	83 (39.0)	7 (3.3)	0.11
	<b>P1</b>	7 (3.0)	94 (40.7)	34 (14.7)	91 (39.4)	5 (2.2)	
<b>Question actions of superiors</b>							
	<b>P0</b>	19 (9.0)	59 (27.8)	51 (24.1)	79 (37.3)	4 (1.9)	0.12
	<b>P1</b>	13 (5.6)	77 (33.3)	71 (30.7)	66 (28.6)	4 (1.7)	
<b>Plan so that errors are not repeated</b>							
	<b>P0</b>	2 (0.9)	17 (8.1)	30 (14.2)	135 (64.0)	27 (12.8)	0.54
	<b>P1</b>	3 (1.3)	21 (9.1)	42 (18.1)	146 (62.9)	20 (8.6)	
<b>Changes are informed</b>							
	<b>P0</b>	4 (1.9)	23 (11.0)	43 (20.6)	121 (57.9)	18 (8.6)	0.30
	<b>P1</b>	8 (3.5)	37 (16.1)	53 (23.0)	116 (50.4)	16 (7.0)	
<b>Safety of the patients is a priority of the organization</b>							
	<b>P0</b>	8 (3.8)	9 (4.3)	42 (19.9)	117 (55.5)	35 (16.6)	0.16
	<b>P1</b>	6 (2.6)	24 (10.3)	44 (19.0)	125 (53.9)	33 (14.2)	

P0=data from 2012; P1= data from 2016/17 **Note: GLM analysis controlling against confounding variables: healthcare setting (hospital / primary care), employment status, and age, did not show statistically significant differences, except in the item “errors are used against” where the association disappears (GLM F= 0.40; p=0.52).**

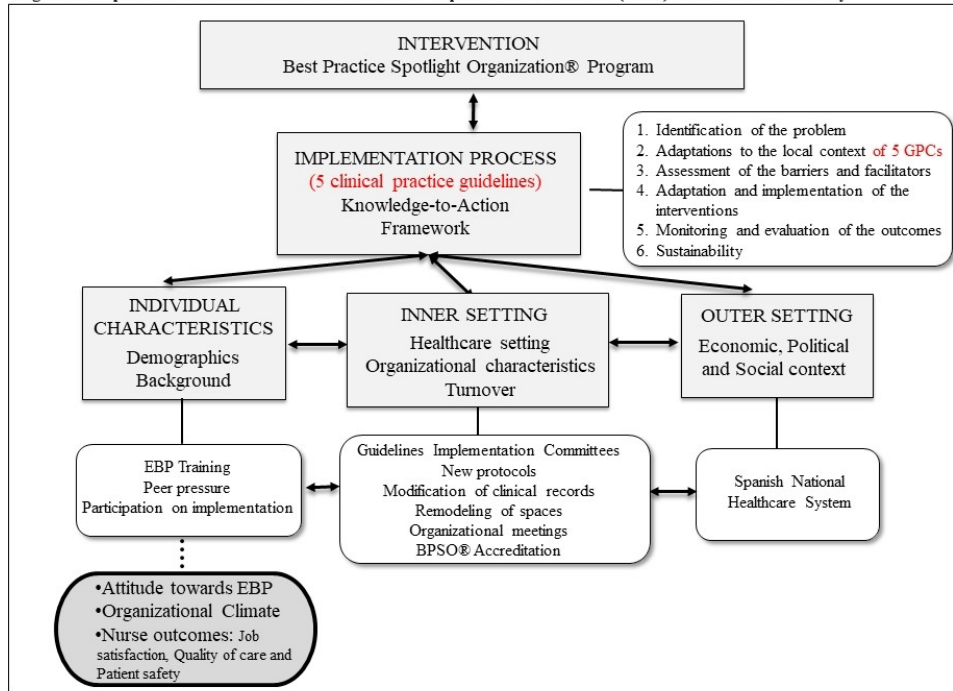


**Table 7. Multivariate analysis of the relationship between the socio-occupational variables, organizational climate and job satisfaction with the attitude towards the EBP, the overall job satisfaction, the quality of care, and the patient safety in both periods (P0 n=219; P1 n=232)**

	Attitude EBP		Job satisfaction		Quality of care		Patient safety	
	P0 OR (CI95%)	P1 OR (CI95%)	P0 OR (CI95%)	P1 OR (CI95%)	P0 OR (CI95%)	P1 OR (CI95%)	P0 OR (CI95%)	P1 OR (CI95%)
<b>Socio-occupational</b>								
Intern			0.15 (0.04-0.50)					
Staff							0.35 (0.13-0.93)	
Primary care					3.06 (1.15-8.10)		2.53 (1.10-5.82)	
Training EBP	2.79 (1.50-5.19)	3.40 (1.87-6.17)						
<b>Organizational climate</b>								
Autonomy					6.44 (2.11-19.71)		2.79 (1.47-5.26)	
Cohesion			3.78 (1.07-11.33)				2.09 (1.03-4.25)	4.57(2.11-9.87)
Trust	2.46 (1.06-3.55)			0.19 (0.04-0.82)		0.22 (0.06-0.73)		0.23 (0.11-0.44)
Pressure						4.53 (1.50-13.7)		2.43 (1.12-5.26)
Support					3.45 (1.10-10.83)			
Recognition					0.24 (0.06-0.87)			
Fairness					6.50 (1.66-25.46)			
Innovation		2.69 (1.10-6.63)						
<b>Job satisfaction</b>								
Peer relationship				4.06 (1.46-11.2)				
Annual leave				2.60 (1.00-6.75)				2.39 (1.02-5.63)
Staffing					2.87 (1.10-7.42)	3.24 (1.24-8.45)		2.66 (1.15-6.15)
Resources		3.85 (1.85-7.97)					2.70 (1.20-5.82)	2.97 (1.37-6.41)
Professional development					5.39 (1.12-25.79)		2.63 (1.15-6.01)	2.10 (1.01-4.35)

OR: Odds Ratio; CI95%= Confidence interval at 95%; P0=data from 2012; P1= data from 2016/17

Figure 1. Adaptation of the Consolidated Framework For Implementation Research (CFIR) to the intervention study



Adaptation of the Consolidated Framework For Implementation Research (CFIR) to the intervention study

254x190mm (96 x 96 DPI)