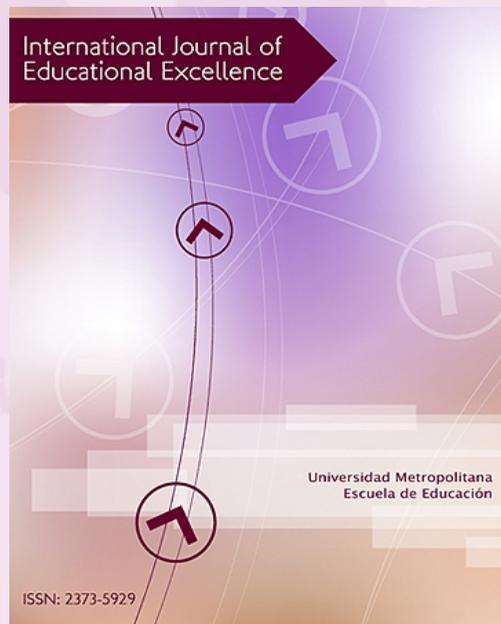


# International Journal of Educational Excellence

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# *International Journal of Educational Excellence*

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Editor-in-Chief: **José Gómez Galán**

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# International Journal of Educational Excellence

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# **Impact of Mandatory Service-Learning Course on Civic Attitudes and Skills: Case Study in Ecuador**

**Karla Díaz Freire<sup>a</sup>, Nascira Ramia Cárdenas<sup>a</sup> and Laura Garlock<sup>b</sup>**

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**Abstract:** This mixed-methods study examined the impact of a mandatory service-learning course on students' civic attitudes. The Civic Attitudes and Skills Questionnaire (CASQ) developed by Moely, Mercer, Illustre, Miron and McFarland (2002) were used to conduct a pre and posttest with students who took the course. Qualitative data was also gathered from in-depth interviews. Quantitative data analysis revealed a significant change on Interpersonal and Problem Solving Skills and on Political Awareness. Interviews further confirmed that students experienced a transformational learning process. The study presents a mandatory course model used in Ecuador that could be implemented in higher education institutions from similar contexts in Latin America.

**Key-Words:** CASQ, civic attitudes, skills questionnaire, civic engagement, experiential learning, transformational learning, interpersonal and problem solving skills.

## **1. Introduction**

While service-learning in higher education is widely used in the United States, countries in Latin America, such as Ecuador, are in the beginning stages of implementing this model. For the purpose of this study, the term service-learning will be defined as “a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development. Reflection and reciprocity are key concepts

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of service-learning” (Jacoby, 1996, p. 5). Students go through a continuous reflection process in order to analyze at a personal and theoretical level the implications of their service hours. The hyphen in service-learning refers to the connection between learning and the service hours since one cannot occur without the other and both are of equal importance. Service-learning involves reciprocity; therefore, students involved in service-learning work together with individuals in the community towards a common goal in an equal relationship where both are learning and benefiting from each other (Jacoby, 1996, Mintz & Hesser, 1996).

As suggested by Mintz and Hesser (1996) there are some principles that should be considered when developing service-learning programs such as: Determining detailed service and learning goals, establishing tasks that will be performed by all the parties involved, allowing monitoring and evaluation of service-learning experiences, and providing concrete opportunities for students to reflect upon their service experience. This paper will present the following: Overview of service-learning, a discussion on civic attitudes as they relate to service-learning, how service-learning has being applied in Latin America and around the world, a discussion of the methods, participants, quantitative and qualitative measures used, a description of the intervention implemented, an explanation of the data collection process, quantitative and qualitative data analysis, a discussion of the limitations, results by research questions and themes, and finally relevant conclusions that emerged from this research.

## **2. Service-Learning Processes and Outcomes**

Service-learning is considered to be a type of experiential education. John Dewey originally discussed this type of learning in his model of experiential learning (Daynes & Longo, 2004, Itin, 1999, Manolis, 2011). College students involved in service-learning courses begin the experiential learning process by having a concrete experience, then reflecting upon the feelings or beliefs produced by the experience, deriving abstract concepts from the reflection process with the instructor’s guide, and finally implementing alternative actions or behaviors when presented with a new experience (Merriam, Caffarella & Baumgartner, 2007, Zhao & Parks, 1995). Consequently, students doing service-learning are in constant reflection with their teachers and peers based on their experience within the community (Kolenko, Porter, Wheatley & Colby, 1996).

Cress, Collier & Reitenauer (2005) reported that students need to be exposed to the challenges faced in society such as hunger and domestic violence so that they are capable of translating theory into practice. Students experience such exposure through participation in service-learning programs that involve work with a vulnerable population, and afterward engage in reflection about these issues in the academic component of the program.

This reflection process is pivotal for a successful service-learning program. As suggested by Beard and Wilson (2006), the professor's role is to promote reflection after learners have a concrete experience. In the classroom, professors can encourage critical reflection about service experiences through different strategies such as weighing evidence, seeking clarification, examining cause and effect, and employing hypothetical questions and summaries (Brookfield & Preskill, 2005). When service-learning students are engaged in their reflection process and are able to have a concrete and direct experience with the community, then their service experience is more favorable (Levesque-Bristol, Knapp & Fisher, 2010). This means that not all of the service-learning experiences are going to positively influence learners; consequently, teachers must be aware of how to use experiential learning theory principles in service-learning.

Experiential learning has certain limitations since it “can be misleading if the information available is limited or incomplete” (Higgins, 2009, p. 48). This means that learning will occur through experience if the facts about a particular subject are understood before the experience occurs. For instance, if students are learning about illiteracy, they will need to understand the concept and implications before going out to the community to participate in a program related to reduce illiteracy.

Transformational learning overlaps considerably with experiential learning, particularly with service-learning. According to Mezirow's (1997) transformation theory of adult learning, learning is “the process of using a prior interpretation to construe a new or revised interpretation of the meaning of one's experience in order to guide future action” (p. 163). Mezirow (1997) identifies two domains of learning: instrumental learning, which involves task-oriented skills, and communicative learning, which includes developing one's own beliefs through reflection. In service-learning programs, learning occurs in both of these domains as students learn new practical skills, engage in communication with different populations, and reflect on what their experiences mean for their understanding of the world. Service-learning is related to transformational learning since it refers to the process by which individuals reflect about their particular points of view and are able to question them in order to transform their previous perspectives (Merriam, et al., 2007).

Moreover, the effectiveness of service-learning programs has been researched and positive and negative student outcomes for students have been found. In one study, students that participated in a service-learning course grew in their political awareness and diversity attitudes in just one semester (Simons & Cleary, 2006). In contrast, Levesque et al. (2010) found that service-learning students did not report higher levels of motivation or civic awareness when compared to students that were not engaged in a service-learning program. Students reported the level of involvement with the target population, and more contact with the target population was associated with a

more positive learning experience. Service-learning students reported a more positive learning climate in courses where components of discussions and reflection were used compared to those classes where an emphasis on discussion and reflection was not a priority (Levesque et al. 2010). A couple of factors were found to negatively impact students' civic attitudes in service-learning programs. One such factor is adult tokenism, where students are given little voice or autonomy in choosing their organization or in their work at the organization (Anglin, Johnson-Pynn & Johnson, 2012). Requiring students to complete a service-learning program was also found to negatively impact the civic attitudes of high school students, though this was not found to be the case with college students (Moely & Ilustre, 2011).

### **3. Civic Attitudes**

One of the goals of service-learning programs in higher education is citizenship education (Jacoby, 1996). A major component of civic and democratic participation is the civic attitudes that each student possesses. A number of studies on the development of student civic attitudes exist in the current literature. Giles & Eyler (1994) connected commitment to civic action with a sense of social responsibility and personal efficacy, finding that participation in a community service lab increased these factors among college students. In a later study, the same authors found that in optional service-learning courses, students who elected to take these courses scored significantly higher on measures of civic attitudes and engagement than those who did not choose to take the courses, which has ramifications for impacts on student attitudes toward mandatory service-learning programs (Eyler, Giles, & Braxton, 1997).

### **4. Service-Learning in Latin America and Around the World**

Service-learning in Latin America has been mainly utilized in school settings (Tapia, 2010). Ecuador is a country where 26% of the population makes less than \$2.57 on a daily basis (INEC, 2013). Ecuador's government adheres to the Buen Vivir framework, which holds that people must interact responsibly with the environment to live well. Under the current president who has held office since 2006, Ecuador has operated with a socialist political system where the government provides social services for the wellbeing of its citizens to decrease socioeconomic disparities (Vanhulst, 2015). Ecuador's government implemented a service-learning program with elementary school children called Solidarity Schools, Service-learning at the college level has not been widely adopted nor studied in Ecuador; however, there is an official governmental requirement of community engagement hours that all college students must complete before they graduate. Apart from the liberal arts

university where this study took place, universities in Ecuador have not adopted a service-learning model to fulfill this requirement.

Educational institutions in Latin America have been using different forms of civic engagement without always labeling them as service-learning; generally this has been the case because the academic component of service-learning was lacking (Tapia, 2004). The Ministry of Education in Argentina introduced the concept of service-learning in schools in 1997 with the Educación Solidaria program that, in addition to promoting service-learning experiences, also provides training for instructors about how to use this model. Higher education institutions in Brazil, Mexico, Colombia, and Argentina have implemented mandatory service hours for their students as part of their curriculum (Tapia, 2004).

In 2002, CLAYSS (Latin American Center for Solidary Service-Learning) was created in order to promote the service-learning model in Latin America. Various higher education institutions in Latin America receive training from this organization in order to implement this model within their institutions (CLAYSS, 2014). □In their study of higher education institutions in Colombia, Pineda-Baez et al. (2014) identified potential benefits of implementing the service-learning model in Colombian universities, including reduced dropout rates and increased motivation in students to transfer what they learned in the classroom back into the community. Another study in a private university in Mexico reported that students were engaged with the community toward the end of their college career though unengaged toward the beginning. However, service-learning and community engagement have been widely promoted as a central tenet of this university's philosophy (Instituto Tecnológico de Monterrey, 2012). A Catholic University in Chile has been using the service-learning model since 2004 and has had over 18,000 students complete a service-learning course. In their research on the effectiveness of this approach, the Chilean university found that service-learning allows students to receive an integral professional instruction, professors are able to change their teaching focus and center on the student, and community relations are enhanced (Jouannet, Salas & Contreras, 2013).

Higher education institutions around the world also implement the service-learning model within their curriculum. A public university in Spain implemented a service-learning course with 162 students in order to work in different projects that worked on diversity, environment, equality, and citizenship. Students were able to choose the project they worked on during the duration of the course and were highly motivated during the implementation phase of the project and demonstrated to be able to critically reflect upon their experiences (Amat & Miravet, 2010). Another University in Spain implemented service-learning with a group of students that used graffiti as a means to create a connection with the community and its social needs (Algado, Portet & Vela, 2013).

The impact of a mandatory service-learning course was previously studied in a private liberal arts university in Ecuador and the results showed that increased empathic concern and altruism were significant outcomes of this intervention, although qualitative analysis suggested a greater impact on civic attitudes and skills (Ramia, 2008). After this research, this university adopted a service-learning model in 2011 as part of its General Education Program. Consequently, this study emerged from a need to understand how Ecuadorian students attending a private university develop civic attitudes and skills when taking a service-learning course. Building on Ramia's (2008) research, this study aimed to test whether civic attitudes in students change after taking a mandatory service-learning course offered by a private liberal arts university in Ecuador, a first step in filling the gap in the literature about effectiveness of service-learning approaches in Latin American higher education. The relationship between service-learning and civic attitudes has not been studied in Latin American higher education institutions and it is relevant to understand if there is a connection between developing civic attitudes and students involvement in service-learning programs.

This study aimed to address the following research questions:

(1) To what extent do students gain in civic attitudes and skills as a result of participation in the mandatory service-learning course?

(2) How do students perceive their service-learning experience and any effects of the course on their attitudes and skills?

## **5. Methods**

A mixed-methods convergent parallel design that separately collects quantitative and qualitative data (Creswell & Plano, 2011) was used to answer the research questions by integrating both types of data in the final interpretation. This type of design was used because one type of data alone could not capture the details of the problem studied. The design's purpose is to employ complementary quantitative and qualitative data to gain a more complete picture of students' experiences and transformations during their service-learning course. Quantitative data gathered was used primarily to address the first research question regarding the effect of the course in students' civic attitudes and skills. For this purpose a before (pretest) and after (posttest) measure was used in order to track individual gains in each aspect. Qualitative data also provided additional information about this effect as seen by the students. The qualitative element provided increased validity and context to the use of the instrument and, more importantly, complemented the information gathered to explore the impact of the intervention and the service-learning experience as perceived by students to address the second research question.

## 6. Participants

The population studied included all of the students enrolled in the service-learning course at the liberal arts university in the summer session of 2014, excluding students taking the online course. The total number of students registered during that period was 222. All students present during the first day of class of each of the nine sections of the course were asked to participate in the study and complete the CASQ. Students who decided to complete the questionnaire, 216 of the 222 possible participants, a 97% initial response rate, became the sampling frame for qualitative interviews. The posttest was completed by 188 participants, reducing the sample size to 85% of the population.

The average age of the participants was 21, with a minimum and maximum age of 18 years and 33 years old, respectively, and a mean age of 20.6 (SD=1.851). In terms of gender, 57.2% of respondents identified as female (N=123) and 42.8% identified as male (N=92). Students represented all fields of study and most levels of study offered at this liberal arts university since this course is a requirement for all students as part of the General Education Program.

In order to select the students to be interviewed, overall scores on the pretest of the CASQ were computed, and participants were divided into five equal strata that ranged from lowest to highest overall scores on the CASQ. A male and female student were then selected from each strata using a random number generator. Given the small number of students selected for interviews, this approach was used to make the qualitative data obtained from the interviews more likely to be representative of the larger sample in terms of gender and civic attitudes. If a student declined to participate in the interview, the next randomly selected student of the designated gender in the strata was asked to participate. An additional student participated in the interview because she confirmed wanting to participate long after the original request had been made, and the next randomly selected student had already been interviewed. In all, five males and six females were interviewed (45% male and 55% female, similar to gender breakdown in the larger sample of 43% and 57%, respectively). Three students were 19 years old, two students were 20, three students were 21, and three students were 22. The students came from various fields of study, including: business administration, physics, international relations, environmental sciences, psychology, industrial engineering, biotechnical engineering, electrical engineering, mechanical engineering, contemporary arts, and nutrition. In many ways, therefore, the interviewee sample reflected the larger student population.

## 7. Measures

### 7.1. Quantitative

The CASQ was developed by Moely et al. (2002) at Tulane University. This questionnaire was based on service-learning outcome measures (Astin & Sax, 1998, Eyler et al. 1997, Markus, Howard & King, 1993). Moely et al. (2002) administered the CASQ with six subscales: Civic action, interpersonal and problem solving skills, political awareness, leadership skills, social justice attitudes, and diversity attitudes to college students along with additional measures of social desirability, the modern racism scale, value of college, and mastery orientation to test for internal consistency and reliability. While the instrument was found to have relatively high validity and reliability with a college sample in the United States, the authors recommended further research including interviews to further confirm validity of the scales (Moely et al., 2002). While the original study by Moely et al. (2002) was conducted with largely White samples, Anglin et al. (2012) and Duplantis (2013) found the CASQ to be appropriate for use among ethnic minority middle school, high school, and college students living in the United States. It is important to mention that reliability and validity evidence has been presented for the CASQ in English (Moely et al., 2002) but not in Spanish.

The instrument used in this study was a translated version of the CASQ done by two researchers who are bilingual (English-Spanish) and Ecuadorian. The Spanish version of the CASQ was administered as a pre and posttest. The CASQ is made up of 44 Likert scale questions (1=strongly disagree, 5=strongly agree) in the six subscales already mentioned. The internal consistency of the pretest data was measured using Cronbach's Alpha, with a value of 0.891, which showed a strong internal consistency with this sample.

### 7.2. Qualitative.

The qualitative data was collected through a structured interview. The interview was used to confirm if the use of the instrument, developed within a different national and cultural context, was translated accurately to this culture and to explore the impact of the intervention and the service experience as perceived by students (second research question). The following questions were used in the interview:

1. What past volunteer experiences have you had?
2. What do you think about the social problems in Ecuador?
3. What is your role in relation to the social problems in Ecuador? What do you think will be your role as a citizen when you graduate?
4. What has your experience been like so far in the organization you have been working with?
5. What concrete experiences have you had during the PASEC (service-learning) course that has influenced your perspective on the social reality of Ecuador?

6. Have you undergone a process of change in your ideas or plans during this time? If so, what has that process been like?

7. What is your opinion of the (name of liberal arts university)'s decision to include service-learning as a graduation requirement?

8. What recommendations do you have for the PASEC course in the future?

## **8. Procedures**

### **8.1. Intervention**

The hybrid service-learning course used as an intervention in this study was offered during the summer of 2014 with nine sections taught by six faculty members. All of the students from this institution are required to take the service-learning class as part of the General Education program. The only prerequisite for taking the course is for students to have completed their first year of studies. The main focus of the summer course was social problems in Ecuador touching on a different topic approximately every week (poverty, strengths perspective, health, education, vulnerable populations, human rights, gender and discrimination). Students met once a week in a face to face session during eight weeks and also used a learning management system. All the course activities asked for students to relate their service experience with the weekly topic and readings. Both written and oral reflections were encouraged in the classroom and in online activities through discussions, journal writing, article critiques and a final portfolio. The portfolio included a series of reflection activities where students proposed an action plan to continue their involvement within their communities.

Students did their 80 service hours in different community agencies with which the university has an agreement. Some of these organizations have had this agreement with the university for more than ten years and others are new to this partnership. Students were free to choose which agency they worked in within a list of approximately 40 institutions that serve infants, school-aged children, adolescents and adults in urban and rural communities in Ecuador. Students decide in conjunction with the organization's administrator what specific tasks of direct service they would perform. A written agreement is signed by the student and the organization that states the specific activities students will be doing. After the completion of the service hours, both the student and the organization representative assess each other's performance.

Professors followed a master syllabus with the same objectives and major assignments, but each introduced their own variations in readings and class activities. Faculty were not all formally trained in service-learning but they all had at least three years of experience teaching this course. The students that participated in this study came from the nine different service-

learning sections offered during the summer of 2014 and their syllabi and activities follow the same learning outcomes.

## 8.2. Data Collection

Data was collected, as mentioned previously, during the summer session of 2014. Data included demographic data, CASQ scores, and qualitative data obtained from the interviews. Demographic data collected were students' age, gender, service-learning professor, field of study, and student identification numbers. Student identification numbers were necessary to match pre and post CASQ responses to test for change in attitudes and skills.

Individual responses to each of the 44 items on the CASQ were recorded for the pretest. Nine items were phrased negatively in the CASQ, meaning that unlike most of the questions where 5 would signify the greatest level of civic skills or engagement, on these questions 5 be the lowest level of civic skills or engagement, so these items were reverse-scored before data analysis. Overall scores on the CASQ for each student were then calculated. In addition to the CASQ questionnaires administered to all participants, 11 students were randomly selected for in-depth interviews using stratified sampling to ensure that a range of scores on the CASQ and genders were represented in the interviews. Students were randomly selected from strata of scores on the CASQ in order to increase trustworthiness of the results by ensuring that respondents represented a wide range of initial civic attitudes.

During the last week of the course, students were asked to complete the CASQ for a second time, and responses were recorded again on the 44 items of the CASQ as a posttest. The same procedure was used for the negatively phrased items and overall scores were calculated. Institutional IRB approval was obtained before the study began and a disclosure statement was included in every survey, which indicated that student participation was voluntary, that it would not affect their grade in the course, and that data shared from the study would not include their identifying information. Students were also told that they would be asked to complete the questionnaire a second time during the last week of classes, and that they may be selected for a voluntary interview. Students were given class time to complete the surveys at the beginning of class during the first and last classes of the eight-week course. There was no incentive to participate other than to assist in evaluating the program. Two of the researchers from this study teach service-learning courses at the institution where the study was conducted and that is how they got access to potential participants; however, the research assistant was in charge of administering the CASQ and students were informed that their participation was voluntary.

A research assistant from the U.S., who was not involved in teaching or grading the service-learning course, conducted the interviews and qualitative analysis. Using an outsider for the interviews was intended to increase the freedom respondents felt to express their true sentiments about their

experiences and the program as well as decrease potential bias in analysis. Interviews were arranged individually with each randomly selected student who agreed to participate during the fifth or sixth week of class. The interviews took place in available classrooms at the university, and generally lasted between 10 to 20 minutes. Interviews were conducted in Spanish, and student responses were audio recorded and transcribed for analysis. The interviewer used probing follow-up questions to encourage students to expand on short or unclear answers, though no follow-up questions differed greatly from the structured interview questions listed above. The interviewer, a native English speaker with a bachelor's degree in Spanish, translated individual responses into English for the purpose of inclusion in this article. The methodology of translation used was faithful translation, with the primary intention of translation being to conserve the speaker's meaning in Spanish as well as reflect his or her tone and level of formality. The underlying meaning and tone, rather than the literal words, were seen as the most important pieces of information to conserve in translation in order to shed light on interviewee's perspectives on service-learning. The responses were not back-translated, though using professional translators and back-translation would be a preferred model in the future.

### 8.3. Quantitative Data Analysis

Quantitative data were analyzed by using a Wilcoxon Matched Pairs Signed-Rank test and a confirmatory Repeated Measures Analysis of Variance. A Wilcoxon signed ranks test was used to compare the medians of the pre and post measures of the average of each factor of the instrument related to the course as an intervention. The Wilcoxon Matched Pairs Signed-Rank test was used with this data, which represents a one group pretest-posttest design without a normal distribution (Sheskin, 2003). The Repeated Measures Analysis of Variance, like the Dependent Samples T-Test, is one of the best data analysis procedures to use in a design such as this one because participants act as their own controls (since there is no control group). This procedure has less error variance and greater power because the errors of individual differences are removed from the calculation (Smith, Gratz & Bousquet, 2008). Nonetheless, this statistical test assumes a normal distribution of data, which we do not have in this case because data came from a Likert-scale instrument.

### 8.4. Qualitative Data Analysis

The approach used to analyze qualitative data was an inductive thematic analysis, which was determined to fit best with the mixed methods approach of the study (Percy & Kostere, 2008). Data that related to the research questions were manually coded into concepts and sorted into emerging themes. All qualitative analysis was done with the data in Spanish, and later, individual quotes were translated to English to include in this article.

Representative quotes were chosen to illustrate the identified themes, as well as to supplement quantitative evidence for the impact of the service-learning course as seen from the participants' point of view.

## **9. Limitations**

One important limitation of this study is that students were all placed in different organizations for their service hours, and the quality of their experiences in their placements likely affected the impact of the course on their civic attitudes and skills. Students also had previous service or volunteer experience and these experiences may have framed their expectations and their attitudes to this new service experience.

Because this study did not use a comparison or control group, there are possible threats to internal and external validity. Maturation, or the natural growth of students between the pre and post administrations of the CASQ, could have had an effect on the change in scores. However, the short time frame of eight weeks between the pretest and posttest should help mitigate maturation effects. At the same time, the short intervention may not have produced an important effect on the sample. It is difficult to account for other classes or activities that may have led to gains that affected posttest scores.

The sample used in this study is not representative of the Ecuadorian college population since a private university context was utilized and public institutions were not considered. The results of this study are only generalizable to similar populations. Additionally, the summer course lasts eight weeks, and qualitative interviews were conducted during the fifth and sixth weeks, which gave participants a short window of time to undergo transformation of their civic attitudes.

## **10. Results and Discussion**

Results on the pre and post administrations of the CASQ are presented to address the first research question, which seeks to assess the amount of change in students civic attitudes and skills after taking the service-learning course. Following this quantitative analysis are the qualitative results of the in-depth interviews. To address the second research question, the qualitative analysis aims to understand students' perceptions of their growth (or lack thereof) in civic attitudes and skills in response to the course. Results are organized by research question.

### **10.1. Student Gains in Civic Attitudes and Skills**

The Wilcoxon signed ranks test indicated that Factor 2: Interpersonal and Problem Solving Skills, and Factor 3: Political Awareness showed significant gains between the pre and post measure. The rest of the factors yielded no significant changes between pre and post measures. Factor 2

yielded a  $Z=-5.055$ ,  $p=.000$  and Factor 3 yielded a  $Z=-5.264$ ,  $p=.000$  (see Table 1).

A repeated measures ANOVA test was also conducted which confirmed a significant gain in Factor 2 ( $F=25.73$ ,  $p=.000$ ) and Factor 3 ( $F=34.30$ ,  $p=.000$ ). The gains on these two areas are further discussed with the qualitative results.

## 10.2. Students' Perceptions of Service-Learning Experience

From the qualitative analysis, several themes emerged relating to how students viewed their service-learning experience and the extent to which the service-learning course affected students' civic attitudes and skills. Results are organized by emerging theme. Overall findings are some evidence for improvement in Factor 3 (Political Awareness) and significant evidence for improvement in Factor 2 (Interpersonal Skills and Problem-Solving) that corroborate quantitative findings on the CASQ. Evidence for improvement in all other factors were also found to some extent, suggesting students may have made more gains in civic attitudes and skills even if improvement on the CASQ was not found to be statistically significant. Students identified what was helpful and what would be helpful in creating an effective service-learning experience, which can inform subsequent iterations of the service-learning course at this university to improve gains in civic attitudes and skills.

*Theme 1. Positive relationships with staff and clients increase motivation and empathy.* Most interviewees identified their personal interactions with the client population and/or organizational staff as being pivotal in having an impactful experience in their organization. One type of interaction that students most often identified as improving the impact of their experience was feeling appreciated by the clients or the staff. One student emphasizes the appreciation she felt in her organization and its impact on her motivation and feelings of effectiveness: "I became super attached to the kids, and that motivates you to want to help them and teach them because they're really affectionate kids. As soon as they see you they come hug you, and it's really sweet, and that motivates people. And the teachers also see that you're not just going for your class [requirement], but that you're motivated and you ask what else you can help with. It's also nice when the teachers are fond of you."

A second impactful type of interaction that students identified was learning about the social realities facing clients through their stories or lived experiences. A student illustrates a moment in which she realized a way that her reality was from that of her colleagues and the children she worked with, recalling, "When we went to the movie theater, many of the little ones had never been before, and that moved me a lot. What's more, a teacher, the cook, who is 20 and a mother of two, in her whole life she'd never been to the movies and that moved my heart a bit." A third student relates his experience observing social issues while building relationships: "I've really liked [my

internship] a lot because I interact a lot with the patients, like after an operation I go and visit them and talk with them. Because sometimes they have a different reality. Like they're sitting in a hospital bed, and a bunch of nurses come and check things or give them catheters [...] [and I'm] conversing with them, asking how they feel, and for me to see these marked things in society – poverty – and be able to intervene really fulfills me, it's a nice experience for me.

As can be seen in the selected examples above in both of these types of interactions – feeling appreciated or gaining insight into others' lives and struggles – building relationships to have these sorts of interactions was associated with feelings of efficacy and motivation in the internship. These interactions also relate with the CASQ Factor 2, Interpersonal and Problem Solving Skills, defined as a self-evaluation of own ability to “listen, work cooperatively, communicate, make friends, take the role of the other, think logically and analytically, and solve problems,” and thereby support overall gains in the CASQ found for this factor (Moely et al., 2002, p. 18). Furthermore, interviewees often related these personal interactions and attachments to an increase in empathy not only toward the individuals, but also toward more generalized marginalized populations. One student explained: My changes have been more emotional because I became really attached to the children, so now I'm moved more when I see low-income people. I've also realized that I see myself as more committed now. This has transformed into a responsibility for me, so that even when I'm done with the PASEC course, I want to keep helping them.

Another student illustrates, “After seeing so many people go through that difficult situation, it changed my way of thinking. More than anything, it's putting myself in others' shoes.” Developing empathy for groups outside of the individual's culture reflects an improvement in CASQ Factor 6, Diversity Attitudes, defined as “attitudes toward diversity and their interest in relating to culturally different people” (Moely et al., 2002, p.18). Furthermore, such experiences of revising a paradigm following a significant experience constitute transformational learning (Mezirow, 1997).

Just as positive interactions seemed to strengthen the impact of the internship, the opposite also appeared to be true, in that negative and unsupportive interactions led to feelings of uselessness and lack of commitment. A student explains, “I'm more like a dead thing [at my internship] and I just follow orders and do what they tell me to do, so it's not like I help the kids much. I try to teach them to talk but if they don't want to talk and start crying, [...] I think they get upset since they don't know how to express themselves and they get stressed and cry. And then the teachers stand there giving you a bad look [...]. So I think that really I'm not doing anything.” This student was not interested in working with toddlers and felt unsupported and unappreciated by the agency staff, leading her to feel even

more unenthusiastic and ineffective in her placement, focused on herself and not others.

*Theme 2. Despite current lack of civic engagement, students hope to make a positive impact in the future, particularly after taking the course.* When asked what their role was in addressing social problems in Ecuador, seven of the eleven interviewees said that they either did not have a role or that they were doing very little, especially outside of their internships. A few examples include: “I sincerely haven’t done anything about it [...] I don’t have a very involved role in solving these problems;” “I don’t think I’ve had a very active role;” “I think for the moment I’m not doing anything. I’m in the nothing category;” “Right now I don’t have a particular role.”

However, many students expressed feeling an obligation to be civically engaged, especially in the future, even if they were not engaged at the moment. They often tied this obligation to learning about social realities, and to their identity as part of the community. For example, a student stated, “I think everyone has a role and that obviously I’m Ecuadorian so I’m part of this and I have a role and I should do something about it. [...] It’s something in my upbringing since childhood, my parents always tried in small ways to make things better [...]” A second student said: “I really like participating, in an active way. I like to dive in and see how programs work and look for deeper goals [...] Like any citizen, you can’t reject society but instead through society, you have to participate so that things improve.”

In terms of future roles in civic engagement, most students found a way to connect their field of study to the social problems they were learning about, including an architecture student who wants to design sustainable low cost housing, a bioengineering student who wants to find treatments and preventions for diseases that affect people in poverty, and a nutrition student who wants to focus her work with low-income families. Three other students hoped to either start or evaluate social programs in the future as well, all of whom were either directly motivated to do so by the course, or encouraged in existing plans, as the following student explains: “I think more than a change [in plans], [the course] has been like a push toward the idea I’ve had for years about starting an organization, like it made me want to do it more.” The architecture student spoke about how he would incorporate social justice in his career, saying, “When I graduate, I’ve always thought about serving the community because it’s worth nothing to be the best architect if it doesn’t serve others.” This quote demonstrates that the student is attaching meaning to serving the community in the future. These students’ plans to engage and lead in the future connect with the CASQ Factor 1, Civic Action, defined as having a goal to become involved with community service or action in the future, and Factor 4, Leadership Skills, defined as self-evaluation of ability to lead effectively (Moely et al., 2002).

*Theme 3. The academic component, while not as impactful as the internship, helps to develop critical thinking skills, frameworks for*

*understanding social issues empathetically, and reflection on experiences.* Students identified several aspects of the classroom component that they found helpful. Students appreciated exploring different social topics each week, investigating causes of social issues, evaluating different sides of an argument, and reading the news regularly for class. These last two items are illustrated in the following quote: [The professors] make you find an article that relates to the topic you're working on that week. [...] In Ecuador you find articles in favor of the government, or against the government [...]. Here they teach you to see the two perspectives, and how you're embedded or involved [in the issue]. You can see which of the two is right, or if they both give you a half-truth, so you become more informed.

This student spoke about how she plans to continue reading the news regularly to stay informed following the course, relating to the CASQ Factor 3, Political Awareness, defined as a self-evaluation of awareness of current events and political issues, locally and nationally (Moely et al., 2002). This supports the quantitative gains students made on this factor between pretest and posttest. However, about half of the students felt they had already been exposed to information on social and political issues through other courses or reading the news, so they may have not gained significantly in this area directly through the class. Several mentioned learning more from direct exposure in their internships, which may help to explain the gains in Factor 3 on the CASQ for students who felt familiar with the information already: Up to this point, not much [has impacted me from the class] because what we've seen in the class are things I already knew. The class itself hasn't influenced me. What did influence me is even though I'd already worked with children with limited resources and been close to parents [...] each family always has a different story and that teaches you more, no? So the class has been the experience in the organization.

New frameworks for understanding etiology of social issues that were introduced in the class were also found to be valuable. One student summarizes, "Ultimately what impacted me the most [in the class] was the mentality that we Ecuadorians now have toward [...] poverty. We don't think that people are poor because they want to be anymore, but rather because they can't escape it." Another student described how her view of youth in poverty changed after applying this framework: It used to bother me a bunch when people would start to wash my car windows on the street. It's not that it doesn't bother me anymore but now I look at them and see that they're really young, they're kids, I don't know, 16 years old, and they devote themselves to that. And I start thinking, it must be that really they couldn't find anything else. What must their life be like, what was their childhood like?

Like the personal interactions and observations, the framing of poverty as a result of systems of oppression rather than shortcomings or failures of individuals led to an increase in empathy. Using a similar framework, other students also identified systemic issues as causing inequality, such as sexism,

poor quality of education, racism, divided social classes, deficient and discriminatory health services, and child labor.

As their CASQ scores would suggest, the interviewees in this study represented a wide range of civic attitudes, and many students did not adopt this type of systems of oppression framework. Using this framework corresponded with high scores on the CASQ for Factor 5, Social Justice Attitudes, defined as self-report of agreement with attitudes toward poverty and the solution of social problems (Moely et al., 2002). Several students spoke about how poverty and other social issues were perpetuated by negative attitudes (“I think that people unconsciously have in their minds that they can’t do things and they close themselves in a world of pessimism”) or by poor parenting skills (“it’s a lack in knowledge on the part of their parents where they don’t know their rights and also aren’t interested in bringing their children to the doctor a the normal times”), attitudes that correspond with lower scores on Factor 5. Some students held simultaneous views about the causes of inequality stemming from both systemic and individual problems. To assess how student perspectives change on these issues throughout the course, it would be helpful to do two interviews at different points in the term.

Out of all of the helpful aspects of the classroom component identified by students, the aspect that came up most was having space to process internship experiences and observations with fellow students. Such reflection is a central component of service-learning (Jacoby, 1996). As one student describes it, “Everyone, when they talk, they share their experiences. And many of them make us happy or leave us fearful because we didn’t know that was happening. Each experience is different and gives you something.” Another student described: Maybe the discussions we have in the class itself [were most impactful] because we’re 24 people in the class and our professor lets you discuss your experience, how it seems to you. It could be that there are a bunch of kids working with older adults or the work with adults or they work with children [...] so you can listen to what they have to say about how that population behaves in general and that part strikes me as really enriching.

A student whose professor did not seem to focus as much on this collective reflection and processing identified this component as something that was necessary but lacking: There should also be a space that people can discuss their experiences. Not only with something you do as an assignment but rather something that affected you a lot, someone stands up and says this happened with this person, I had this experience, because everyone can learn from each other. And that’s missing.

Therefore, this qualitative feedback supports the importance of incorporating significant opportunities for students to collectively reflect on their experiences to foster their transformational learning.

*Theme 4. Service-learning should be a university requirement in order to foster student personal development and acknowledgment of privilege.* All 11 students interviewed expressed support for the service-learning course

being a graduation requirement. The most salient reason given for requiring this course, mentioned by most of the students, was that the course and internship provide an important experience of leaving the privileged bubble of the university and learning about issues facing communities. This was seen as important to students because it provided them with ways to grow – either through gaining empathy, gaining skills for working with others, or developing plans for how to relate their future work to helping society.

The following student explains how leaving a space of privilege can affect development of empathy: I think that with this class, people become much more humble and understanding, more altruistic, like they open their heart to what's going on. Because there are many people who don't know, who aren't aware, who live in their world of having everything, sometimes lots of money, and they leave people in need off to the side. So having this class really opens the heart a lot. You say, 'dang, this is happening in my country. I live in my country with a lot of money, and there are people who really live on a dollar a day. Another student discusses developing skills: "You're taught how to interact with society or solve its problems and later you're going to be able to face those problems better. [...] I think all universities should do it [service-learning course]." A third student connected the experience to informing how to be helpful to society through future work: [The service-learning course] seems super fundamental to me because of the fact that being in an educational institution separates you from society a lot. So PASEC brings your feet back on the ground and pushes you to think about what you can with your degree for society. [...] it seems really basic to me that you need to have human contact and think about all the concepts you learn during your years in college and put them in practice.

Finally, a fourth student noted a way in which the privilege of students at the university could be leveraged through a service-learning program: [The service-learning requirement] seems like an excellent idea to me [...] and since it's a good quality school with a high academic level, I hope that all of us who will graduate will be excellent professionals with a good economic situation, so it's a good principle to get attached to volunteer work, and in the future to help in the organization you interned at or whichever one you want.

This student recognizes that the graduates of this university will be influential in the country, and therefore it is especially important that they learn and care about social issues.

Even the two students who initially expressed negative feelings about the required service-learning course supported the course being mandatory for students in general. One student had felt at first that this was another obligation she needed to fulfill and was only trying to get a good grade, and doubted lasting impact: "It's not like this work will continue your whole college career, but rather just in summer break and then it's over and you forget about it and continue your studies, as if nothing had happened." She ended up changing her mind over time about disapproving of the requirement

despite not having a very rewarding internship: Now it seems to me to be a super interesting and enriching experience more than anything, but before I didn't really agree with it. After going through the experience you start to understand some things – some reality that maybe you were blind to or that didn't interest you – so it seems to me now that [the required course] is a good thing.

A second student spoke about how difficult the mandatory aspect of the course was for her since a close family member was dying at the time, and she had to spend time with clients rather than her family. She said, “For me it's been super annoying doing all of these volunteer hours because in order to do good for someone, you have to first be well yourself. And in my case I wasn't.” Despite this experience, she still said that the service-learning requirement “seems good to me. Apart from my experience, for me it was terrible. But [...] to me it seems really important that a person leaves [the university] with at least a somewhat open mind in order to see that there are people in pretty underprivileged situations.

Finally, a few students identified a danger in privileged students working with marginalized groups, if the students have stereotypical ideas about the groups or a savior complex in their role. As one student explains: Sometimes this part of PASEC seems a little bad to me because you're conditioning the person to think they're poor, and that you're helping them, which I don't think is the idea of PASEC but rather that in addition to learning about what their life is like and how it's developing, you are learning from that person, not giving something to that person.

Therefore, a caveat to the required nature of the service-learning program would be that students would first need a strengths-based understanding of the communities and a theoretical understanding of the students' roles in order to not cause harm.

*Theme 5. Students desire more flexibility and autonomy.* A theme that emerged from the qualitative responses about recommendations to improve the service-learning course was to increase flexibility in several ways. Students wanted to be able to intern at organizations other than the ones approved by the university: “If you want to do a new agreement with another organization that you want, it takes to much time. They don't give you the chance to choose the one that you want. They make it a bit difficult.” A student mentioned wanted to do internships in other parts of the country: “It strikes me as super interesting to go to the rainforest [eastern Ecuador], go to other areas to help more [...] I think the class limits you a bit because you have to come once a week so you can't spend two weeks outside the city.” They also desired more flexibility in their projects: “I think that the projects that they make us do should be a bit more guided and not as strict. It seems that they're really strict.” These ideas resonated with findings of Moely & Ilustre (2011) that students will feel less negatively about a required service-learning course when they have a considerable amount of choice and agency

in how they can fulfill the requirement. Exploring ways to give students more options in future service-learning courses may improve the impact of the experience for the students at this Ecuadorian university as well by decreasing resentment about the required nature and supporting students' agency.

Quantitative findings suggest that students gained in civic attitudes and skills with the mandatory course specifically in Interpersonal and Problem Solving Skills and Political Awareness areas. Interpersonal and Problem Solving Skills are related to how students evaluated their ability to listen, work as a team, communicate, make friends, take the perspective of another, and solve problems (Simons, Blanc, Russell, Williams & Willis, 2009). Political Awareness is how students assessed their own awareness regarding local and national affairs and political events (Simons et al., 2009). These findings were confirmed with qualitative data gathered and complemented by a perceived gain by many interviewed students in all areas of civic attitudes and skills. Typically all service internships involve some level of interaction and cooperation with others, often times with people who may have had significantly different life experiences than the students. This interaction with people different from themselves provided students with the opportunity for growth in Interpersonal and Problem Solving Skills as they navigated these new social situations along with a theoretical background in social issues from the course. Similarly, results also suggest that emphasis in following the news and class discussions about current national affairs were effective in informing students.

Given that students had statistically significant gains on the CASQ, which qualitative data support, there is initial support that the service-learning course does have a positive effect on student interpersonal and problem-solving skills as well as political awareness. The service-learning class could have a larger impact through increasing student autonomy and fostering more classroom discussion and critical reflection on student experiences.

Considering their privileged status, Ecuadorian students at a private university are more likely to enter positions of power upon graduation, as one student noted, as is the case for similar university students in Latin America. For this reason, private university students could benefit from receiving a strong foundation in their civic development, starting with developing their awareness of the reality of others in their country and being able to appreciate the perspective of someone different from them. The mandatory service-learning course, exposes these students to other realities as well as connects them to community organizations around them. Although, it is true that true service-learning is of mutual benefit to students and to the organizations and people they serve, the focus of this research was the impact on the students. In class and through the readings, students were exposed to and reflected upon ideas of social justice that include acknowledgement of privilege and equality of rights and opportunities. This focus is very relevant in this context

that is similar to other Latin American countries where there is a wide gap between the richest and poorest.

This study contributes to a better understanding of the use of service-learning models in higher education institutions in Latin America. The results support an effectiveness of the service-learning model as a mandatory course in a private university in Ecuador, and therefore may provide evidence to expand service-learning initiatives elsewhere in Ecuador and Latin America, including Argentina, Chile, Brazil, Mexico, and Colombia, where some service hours are already required. Students may develop interpersonal and problem solving skills as well as political awareness after taking a mandatory service-learning course, as well as become more empathic. If students are given at least some agency to choose their placement, it is likely that as with the sample of interviewees, students will be generally supportive of the required nature of a service-learning course, particularly upon completion. For these reasons, other institutions in Latin America could consider applying a mandatory service-learning requirement within their curriculum and expect some positive outcomes in students' attitudes and skills.

After conducting this study it is recommended to revise the translated version of the CASQ using the forward-backward methodology. Another future study would be to conduct a factor analysis of the CASQ within this particular population to develop a more culturally relevant instrument. Later, a replication of this study could be implemented to determine if the modified version of the instrument leads to different results and test for reliability. This study was implemented during a summer term; therefore, conducting a study with a semester-long course could be interesting to analyze since students have more time to reflect and perform their service. In addition to the mid-course interviews, pre interviews could be conducted to get a baseline on student attitudes and skills, and post interviews could also be done months after completing service hours in order to determine if impact remained. An additional topic for further study would be to assess the experience that the community service agency staff and clients have with the student interns. That is, is the transformational learning process beneficial for both students and organizations, or are there any drawbacks for the organizations' clients or staff in partnering with students?

## **11. Conclusion**

Quantitative data from this study revealed a significant growth in two areas of the CASQ between pretest and posttest for students in the mandatory service-learning course at the liberal arts university: Factor 2, Interpersonal and Problem Solving Skills, and Factor 3, Political Awareness. These results suggest that students performing their service-learning hours, while reflecting with their peers in class discussions, developed their civic attitudes and skills through personal connections and the opportunities to solve problems.

Additionally, political awareness had a significant change from the pre to the post measurement, which indicates that students became more aware of how politics influence social reality in their country throughout the course. Qualitative data provided additional evidence to understand students' support of the mandatory nature of the course and the positive relationships they developed in their placements. Due to the lack of previous validation of the instrument for this population, there may have been more of a positive impact of the intervention even though quantitative results indicated a significant change in only two factors (although it is difficult to establish causation without a control group). To support this positive impact, qualitative data in this study confirmed that students went through a learning experience that changed their previous perspectives in different areas (transformational learning) while working with underprivileged groups and reflecting upon their previous paradigms and their privileged status (Mezirow, 1997). These results indicate that students went through an experiential learning process in which they reflected upon the connection between the service they were doing and the theory. Students suggest finding ways to increase flexibility in the service-learning course, as well as fostering more critical reflection in the classroom to further increase the transformational learning experience.

## References

- Algado, S., Portet, X. & Vela, J. (2013). Aprendiendo servicio universitario: Creando empleo a partir de la emprenduría social. *Historia y Comunicación Social*, (18) 627-638.  
doi:10.5209/rev\_hics.2013.v18.44265
- Amat, A. & Moliner, L. (2010). El aprendizaje servicio en la universidad: Una estrategia en la formación de ciudadanía crítica. *REIFOP*, 13 (4).  
doi:10.14516/fde.2015.013.019.009
- Anglin, A. E., Johnson-Pynn, J. S. & Johnson, L. R. (2012). Ethnic identity and civic engagement in Latino/a and Caucasian youth. *Journal of Youth Studies*, 15 (5), 621-643. doi: 10.1080/13676261.2012.663887
- Astin, A.W. & Sax, J. L. (1998). How undergraduates are affected by service participation. *Journal of College Student Development*. 39 (3), 251-263.
- Beard, C. & Wilson, J. P. (2006). *Experiential learning: A handbook of best practice for educators and trainers*. London: Kogan Page Ltd.
- Brookfield, S. & Preskill, S. (2005). *Discussion as a way of teaching: Tools and techniques for democratic classrooms*. San Francisco: Jossey-Bass.
- CLAYSS (2014). *Universidades solidarias: programa de apoyo y fortalecimiento de proyectos de aprendizaje-servicio solidario para universidad de América Latina*. Retrieved from [http://www.clayss.org.ar/04\\_publicaciones/UniversidadesSolidarias.pdf](http://www.clayss.org.ar/04_publicaciones/UniversidadesSolidarias.pdf)

- Cress, M., Collier, P. & Reitenauer, V. (2005). *Learning through serving*. Sterling, VA: Stylus Publishing.
- Creswell, J. W. & Plano, V. L. (2011). *Designing and conducting mixed methods research*. Thousand Oaks: SAGE.
- Daynes, G. & Longo, N. V. (2004). Jane Addams and the origins of service-learning practice in the United States. *Michigan Journal of Community Service Learning*, 11 (1), 5-13.
- Duplantis, J. (2013). *Developing social capital: The effect of an academic service-learning component on the civic attitudes of college students*. (Doctoral dissertation). Retrieved from ProQuest Dissertations Publishing. 3569722.
- Eyler, J., Giles, D. E., & Braxton, J. (1997). The impact of service-learning on college students. *Michigan Journal of Community Service-Learning*, 4, 5-15.
- Giles, D. E., Jr. & Eyler, J. (1994). The impact of a college community service laboratory on students' personal, social, and cognitive outcomes. *Journal of Adolescence*, 17, 327-339. doi: 10.1006/jado.1994.1030
- Higgins, P. (2009). Into the big wide world: Sustainable experiential education for the 21st century. *Journal of Experiential Education*, 32 (1), 44-60. doi: 10.5193/jee.32.1.44
- Instituto Tecnológico de Monterrey (2012). *Informe institucional de resultados de la encuesta de participación estudiantil en México*. TEC: México.
- Itin, C. M. (1999). Reasserting the philosophy of experiential education as a vehicle for change in the 21st century. *Journal of Experiential Education*, 22 (2), 91-98. doi: 10.1177/105382599902200206
- INEC (2013). *Encuesta nacional de empleo, desempleo y subempleo*. Retrieved from <http://www.inec.gob.ec/home/>
- Jacoby, B. (1996). Service-learning in higher education. In B. Jacoby et al. (ed.), *Service-learning in higher education: Concepts and practices*. San Francisco, CA: John Wiley & Sons.
- Jouannet, Ch., Salas, M., & Contreras, M. (2013). Modelo de implementación de un aprendizaje (A+S) en la UC: Una experiencia que impacta positivamente en la formación profesional integral. *Calidad en la Educación*, 39, 198-212. doi: 10.4067/s0718-45652013000200007
- Kolenko, T. A., Porter, G., Wheatley, W. & Colby, M. (1996). A critique of service learning projects in management education: Pedagogical foundations, barriers, and guidelines. *Journal of Business Ethics*, 15 (1), 133-142. doi: 10.1007/bf00380269
- Levesque-Bristol, C., Knapp, T. D. & Fisher, B. J. (2010). The effectiveness of service-learning: It's not always what you think. *Journal of Experiential Education*, 33 (3), 208-224. doi: 10.5193/jee33.3.208
- Manolis, C. & Burns, D. J. (2011). Attitudes toward academic service learning semesters: A comparison of business students with non-business

- students. *Journal of the Scholarship of Teaching and Learning*, 11 (1), 13-32.
- Markus, G., Howard, J. & King, D. (1993). Integrating community service and classroom instruction enhances learning: Results from an experiment. *Educational Evaluation and Policy Analysis*, 15, 410-419. doi: 10.2307/1164538
- Merriam, S., Caffarella, R. & Baumgartner, L. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco: Jossey-Bass.
- Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult & Continuing Education*, 74, 5-12. doi: 10.1002/ace.7401
- Ministerio de Educación del Ecuador (n.d.). Retrieved from <http://educacion.gob.ec/proyectos-desarrollados/>
- Mintz, S. D. & Hesser, G. W. (1996). Principles of good practice in service-learning. In B. Jacoby et al., *Service-learning in higher education: Concepts and practices*. San Francisco, CA: John Wiley & Sons.
- Moely, B. & Ilustre, V. (2011). University students' views of a public service graduation requirement. *Michigan Journal of Community Service Learning*, 17 (2), 43-58.
- Moely, B., Mercer, S., Illustre, V., Miron, D. & MacFarland, M. (2002). Psychometric properties and correlates of the civic attitudes and skills questionnaire (CASQ): A measure of students' attitudes related to service-learning. *Michigan Journal of Community Service Learning*, 9, 15-26.
- Percy, W. H. & Kostere, K. (2008). *Qualitative research approaches in psychology*. New York: The Harold Abel School of Psychology.
- Pineda-Báez, C., Bermúdez-Aponte, J., Rubiano-Bello, Á., Pava-García, N., Suárez-García, R. & Cruz-Becerra, F. (2014). Student engagement and academic performance in the colombian university context. *Relieve*, 20 (2), 1-19. doi:10.7203/relieve.20.2.4238
- Ramia, N. (2008). *Development of empathy and altruism in Latin American students: A case study using service-learning at a liberal arts college in Ecuador*. Saarbrücken, Germany: VDM.
- Sheskin, D. J. (2003). *Handbook of parametric and nonparametric statistical procedures*. Boca Raton, FL: Chapman & Hall/CRC Press.
- Simons, L. & Cleary, B. (2006). The influence of service learning on students' personal and social development. *College Teaching*, 54 (4), 307-319. doi: 10.3200/ctch.54.4.307-319
- Simons, L. Blanc, N., Russell, B., Williams, E. & Willis, K. (2009). An exploration of the value of cultural-based service-learning for student and community participants. In Moely, B. E., Billig, S., & Holland, B. A. *Creating our identities in service-learning and community engagement*. Charlotte, NC: Information Age Publishing.

- Smith, L. F., Gratz, Z. S. & Bousquet, S. G. (2008). *The art and practice of statistics*. Belmont, CA: Wadsworth, Cengage Learning.  
doi:10.1177/0022022194254006
- Tapia, M. N. (2004). Civic service in outh America. *Nonprofit and Voluntary Sector Quarterly*, 33 (4), 148-166.
- Tapia, M. N. (2010). Service learning widespread in Latin America. *Phi delta kappan*, 91 (5), 31-32. doi: 10.1177/0899764004270550
- Vanhulst, J. (2015). El laberinto de los discursos del buen vivir: entre Sumak Kawsay y socialismo del siglo XXI. *Polis*, 40, 2-21.  
doi: 10.4067/s0718-65682015000100012
- Zhao, J. & Parks, C. (1995). Self-Assessment of communication behavior: An experiential learning exercise for intercultural business success. *Business Communication Quarterly*. 58, 1.  
doi: 10.1177/108056999505800106



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# **Association between Knowledge, Practice and Attitude towards Nursing Care in the Neural Development of Premature Newborns**

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**Abstract:** The knowledge, practice and attitude of nursing personnel in Neonatal Intensive Care Units (NICUs) are critical in the effort to reduce sequelae in the neural development of premature newborns. This investigation aims to determine the relationship between level of knowledge, practice and attitude of nursing personnel working in NICU and the care and neural development of premature newborns. The specific objectives are the following: to obtain a profile on nursing personnel working in Neonatal Intensive Care Units (NICUs); to determine the level of knowledge of nursing personnel regarding the neural development of premature newborns; to determine the practical application of this knowledge by nursing personnel in the care of premature newborns as regards their neural development; to describe the attitude of nursing personnel when caring for premature newborns as regards their neural development; and to establish the existing relationship between the sociodemographic categories of gender and years working in the Neonatal Intensive Care Unit with the Knowledge, Attitude and Practice of the participants of this study. A questionnaire was administered to nurses working in four hospitals of the Metropolitan area of Puerto Rico. The study was descriptive and correlational with a transversal design; the Pearson Coefficient and Spearman's Rank Correlation were used for analysis. A correlation was found between level of knowledge, practice and attitude of nurses in NICUs and care and neural development of newborns ( $r=.254$ ,  $p < .05$ ), revealing that updating knowledge enables personnel to maintain positive attitudes and apply appropriate nursing care.

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**Key-Words:** Nursing Teaching, Nursing Practice, Higher Education, Nursing Competencies, Caring Skills, Nursing Education, Premature Baby, Nursing Programs.

## 1. Introduction

Most women receive the news of their pregnancy with great excitement, awaiting the required weeks to give birth and receive a healthy, full-term baby. Sometimes, due to certain circumstances, birth takes place before the necessary weeks have elapsed and the baby is born prematurely and presenting certain complications. Although there are organizations around the world dedicated to protecting mothers in their prenatal stage as well as their babies, and even with the great efforts taken and developments to avoid premature births, the rate of premature newborns is still high all around the world, including in Puerto Rico. According to the WHO, more than 15 million premature babies are born each year, of which a million die within a year due to health complications (World Health Organization, 2012). In Puerto Rico, according to the Health Department, 6,980 premature babies were born in 2010, around 16.5% of all births (Departamento de Salud, 2013). In 2011, the Head of Medical Sciences confirmed that one of every five births is premature, and 75% of premature babies born in Puerto Rico are born within 32 to 36 weeks of gestation (Primera Hora, 2011).

A premature baby is born before 37 weeks of gestation, and is classified according to the weeks in gestation. The classification is: late preterm, from 34 to 36 weeks; moderate preterm, from 32 to 34 weeks; very preterm, from 28 to 32 weeks; and extremely preterm, less than 28 weeks (World Health Organization, 2012). The complications a preterm baby can present are related to his gestational age and, depending on their severity, can cause death or health sequelae for the rest of the child's life. Short-term complications include: respiratory distress syndrome, bronchopulmonary dysplasia, patent ductus arteriosus, intraventricular hemorrhage, periventricular leukomalacia, retinopathy of prematurity and necrotizing enterocolitis, among others. Long-term morbidity consists of neurodevelopmental sequelae such as cerebral palsy, cognitive impairment, blindness and deafness, chronic lung disease, failure to thrive, difficulties with feeding, among others (Boat, Sadhasivam, Loepke & Kurth, 2011).

All premature newborns should be cared for in the Neonatal Intensive Care Unit (NICU) by specialized personnel. Advances in research and science have provided new, high-tech equipment for use in NICUs. Along with this research, protocols and standards of care imply a better, more cost-effective and high-quality attention to this population. This means that care for preterm

babies is linked to advances in technology (intensive care) and developments in prenatal care as well as the level of specialization of health professionals equipped to deal with this population (Jorgensen, 2010). These units are specialized branches which require competent employees. Nurses are included among the employees working in NICUs, and they must be proficient in providing proper care to preterm newborns and the use of high-tech equipment, among other things. Nursing personnel is a key element of this unit, as they must provide round-the-clock care and keep track of the changes the patient presents, preventing future complications (Kaur, 2013, Darlow, Zin, Beecroft, Moreira & Gilbert, 2012). Nursing professionals, as leaders in neonatal care, must take three critical concepts into account to ensure proper care for premature babies: knowledge, practice and attitude.

The knowledge of nursing professionals working in specialized units begins with formal education in schools or nursing programs. Once the nurse begins to work and be exposed to complex situations, this basic knowledge starts to increase. Nurses working in NICUs must possess knowledge concerning the development of the newborn baby and the complications which may arise when it is premature. Regarding the neural development of newborns, studies have shown a correlation between premature births and neurodevelopmental sequelae, especially for babies who spent less than 34 weeks in gestation (Fernández, Calderón, & Berrera, 2001, Kiechl-Kohlendorfer, Ralser, Pupp, Peglow, Reiter & Trawöger, 2009). Similarly, the effects in the brain and the developmental consequences of prematurity arising from sudden exposure to bright lights, loud noises and frequent harmful interventions which take place in NICUs have been studied (Als et al., 2004, Sánchez-Rodríguez et al., 2010).

In terms of practice, nursing personnel must carry out their job with full knowledge of existing laws, practice standards and care protocols in their country. Therefore, nursing personnel must use the Nursing Process to reduce the incidence of neurodevelopmental sequelae. Premature birth interrupts the development of the central nervous system during a vulnerable growth process. Passing from a comfortable, intrauterine environment to a stressful environment including bright lights, noise, painful stimuli, sleep disturbances, temperature changes and the ceasing of continuous placental nourishment can adversely affect neurological development. Sequelae brought forth by stressful situations is linked to cognitive, motor and behavioral problems during childhood, adolescence and adulthood (low IQ score, attention deficit and hyperactivity disorder, among others) (Sánchez-Rodríguez et al., 2010).

A positive attitude in nursing personnel when caring for premature babies and their family can increase general wellbeing and reduce neurodevelopmental sequelae. Attitude depends on the level of knowledge nurses possess on specific areas (Polkki et al., 2010).

With the purpose of determining whether there is a relationship between these concepts (knowledge, practice and attitude), the general objective of this

study was to determine the relationship between level of knowledge, practice and attitude of nursing personnel working in NICUs and the care and neural development of premature newborns. The specific objectives included the following: 1) to obtain a profile on nursing personnel working in Neonatal Intensive Care Units (NICUs); 2) to determine the level of knowledge of nursing personnel regarding the neural development of premature newborns; 3) to determine the practical application of this knowledge by nursing personnel in the care of premature newborns as regards their neural development; 4) to describe the attitude of nursing personnel when caring for premature newborns as regards their neural development; and 5) to establish the existing relationship between the sociodemographic categories of gender and years working in the Neonatal Intensive Care Unit with the Knowledge, Attitude and Practice of the participants of this study.

## **2. Methodology**

### **2.1. Design**

The study was descriptive and correlational with a transversal design.

### **2.2. Subjects**

Subjects consisted of nursing personnel working in the NICUs of 4 hospitals in the Metropolitan area of Puerto Rico. Inclusion criteria included: the nurse must have worked in the unit for at least one year and have an associate's, bachelor's, master's or higher degree in nursing; the nurse must be between 21 to 65 years of age and participate voluntarily in this study. Exclusion criteria included incomplete or incorrectly filled out questionnaires. 102 questionnaires were handed out to nursing personnel who met the inclusion criteria, 88 of which were received, 2 of which were eliminated because they did not comply with the inclusion criteria. The final sample consisted of 86 nurses in the selected hospitals.

### **2.3 Procedure**

The "Knowledge, Practice and Attitudes of Nursing Personnel in the Care of Premature Newborn Babies" questionnaire (Conocimientos, prácticas y actitudes en el personal de enfermería en el cuidado de neurodesarrollo del recién nacido prematuro) was used, with due permission and transcultural adaptation by its author Gabriela Alegre Frenández (2011). This questionnaire includes general sociodemographic questions in its first section, and three dimensions encompassing items related to Knowledge, Attitude and Practice. To recruit participants, an advertisement was placed in the NICUs of the selected hospitals to promote the investigation. In coordination with the area supervisor, personnel were oriented regarding the investigation and doubts were cleared up. Questionnaires were handed out, three days were provided to fill them out and deposit them in a sealed box prepared for this purpose.

#### 2.4. Ethical conditions

The Institutional Review Board (IRB) of the Ana G. Méndez University System (SUAGM) approved the study. During this study, the researcher complied with all established regulations concerning research involving human subjects, such as anonymity, confidentiality and privacy. Additionally, subjects were informed of their right to choose not to participate in the study during any stage.

#### 2.5. Analysis

A descriptive analysis of the variables was carried out, using central tendency (mean, median) and dispersion measures (standard deviation) for quantitative variables, as well as calculating frequencies and percentages. To analyze the influence of predictor variables on dependent variables, the Pearson Correlation Coefficient and Spearman's Rank Correlation were used. The *t* test was used to discern significant differences between level of knowledge, practice and attitudes according to gender and years of service. The maximum value of each variable is related to the amount of questions and the value attached to each response by the researcher. Data was analyzed using the statistical program SPSS v.23.0. Results were considered significant at  $p < 0.05$ .

### 3. Results

The sample was composed of 88.4% female ( $n=76$ ) and 11.6% male ( $n=10$ ) participants. 51.2% of the sample was married ( $n=44$ ), 33.7% was single ( $n=29$ ), 12.8% was divorced ( $n=11$ ) and 2.3% ( $n=2$ ) did not specify their civil status. Regarding highest level of nursing education attained, 68.6% of the sample had a bachelor's degree ( $n=59$ ), 29.1% had an associate's degree ( $n=25$ ) and only 2.3% had a master's degree ( $n=2$ ). The age of the participating nurses ranged from 23 to 58. Of the 86 participants, 12 chose not to specify their age (14%). The average age registered was 38. The most years of service working in NICU registered was 27. The average (mean) years of service for this group was 11 years, while the mode was 5 years working in NICUs.

In terms of knowledge, 20 points was considered the optimum level of knowledge regarding the neurodevelopmental care of preterm newborns. The score of the surveyed nurses ranged from 11 to 20, with a typical value of 18 points (mean=17.66, median=18.00). The study revealed that 10 of the participating nurses scored 20, the highest value, while 24 professionals had a score of 19. A total of 53 nurses, or 61.6% of the sample, scored between 18 to 20 points in the knowledge domain. However, a significant percentage (38.4%) scored less than 18 points. Analyzing the responses, the questions

which posed the most difficulty concerned intraventricular bleeding of the premature baby and the organization and structure of their nervous system.

As relates to the domain of practice, a score of 63 was established to indicate good practice. The nurses scored between 37 to 62 points, with a median of 51 points, indicating that none of the surveyed professionals attained this optimum level. Moreover, the mode for 14 nurses (16.4%) was 49. The highest observed values, between 60 to 62 points, were obtained by 5 of the 86 surveyed professionals, which represents 5.8% of the sample. On the other hand, 39 nursing professionals (45.3%) obtained a score of 50 points or less, with 30 nurses obtaining a score under 50, representing 34.9% of the sample. Upon analysis, personnel tended to have more difficulty with the prompts concerning: softly touching the baby with a warm hand without caressing for 12 minutes, four times a day; massaging the baby (caresses and passive leg movements) for 5 minutes, three times a day; establishing sleeping hours; and giving the baby 50% dextrose orally before a procedure.

Concerning the attitude variable, the score obtained by the nursing professionals ranged from 11 to 15, with the mean, median and mode coinciding at 13. Two participants were excluded from this analysis as they did not answer one of the questions, which would have resulted in underestimating their attitude level. We established that the maximum value of 15 points indicated a favorable attitude, and results show that various nursing participants reached this level. Upon examining the distribution of the participants by the attitude scale, 13 participants were located at the highest level, which reflects 15.1% of the sample presenting a favorable attitude. 73 subjects scored close to the maximum, between 13 and 14 points, which corresponds to 84.9% of surveyed personnel. Upon analysis of the answers, participants showed the most difficulty in questions related to unrestricted access of parents to NICUs.

Pertaining to gender, a Student's *t* test was carried out to compare means; results show that men and women surveyed had similar average scores across all three dimensions relating to the care of premature newborns. Upon relating the variables with years of service in NICU, table 1 shows that the level of practice the participants presented was statistically correlated with the years of service they reported. In order to further analyze this result, we prepared a distribution table of study participants in order to compare nurses with less than 10 years of service in NICU to those with 10 years or more. Table 2 shows that 64% of participants with less than 10 years of service in NICU reflected a score over 50 in the practice domain. Among those with 10 years or more of service in NICU, the majority (55%) scored 50 points or less in this domain. This implies that the fewer years of service, the higher the practice score as relates to the care of preterm newborns.

Domains		Value	Asymptotic standard error	Approx. T	Approx. Sig.
Knowledge	Pearson Correlation	-.080	.112	-.731	.467
	Spearman Correlation	-.114	.114	-1.055	.294
	<i>n</i>	86			
Attitude	Pearson Correlation	.074	.110	.674	.502
	Spearman Correlation	.028	.114	.253	.801
	<i>n</i>	84			
Practice	Pearson Correlation	-.264	.098	-2.511	.014
	Spearman Correlation	-.287	.105	-2.746	.007
	<i>n</i>	86			

Table 1. *Correlations, domains of knowledge, attitude and practice in nursing personnel regarding care of premature newborns by years of service in NICU*

Practice Domain		Years of service in NICU	
		Less than 10 years	10 years or more
50 points or less	<i>f</i>	16	23
	%	36.4	55
Over 50 points	<i>f</i>	28	19
	%	63.6	45
Total	<i>f</i>	44	42
	%	100.0	100.0

Table 2: *Level of practice of surveyed nursing personnel as relates to years of service in NICU*

Pertaining to the association between the domains of knowledge, practice and attitude, results showed a significant correlation between these variables. The knowledge of nursing personnel regarding the neurodevelopmental care of premature babies was statistically correlated to the practice level of these personnel, ( $r=.254, p=.018$ ). Similarly, results point to a statistical correlation between attitude and practice in the care of premature newborns as relates to neurodevelopmental care ( $r=.251, p=.021$ ). In summary, variables were significantly correlated and results showed that

knowledge influenced the practice of nursing personnel when caring for premature newborn babies, and that practice was also associated to the attitude of these professionals (see table 3).

Variables		Knowledge	Attitude	Practice
Knowledge	Pearson Correlation $r$	1	.163	.254*
	Significance		.138	.018
	$n$	86	84	86
Attitude	Pearson Correlation $r$	.163	1	.251*
	Significance	.138		.021
	$n$	84	84	84
Practice	Pearson Correlation $r$	.254*	.251*	1
	Significance	.018	.021	
	$n$	86	84	86

\* Correlation significant at 0.05 (bilateral).

Table 3: Pearson's Correlation Coefficients for the main domains or variables of the study

#### 4. Discussion

The results of the study regarding the profile of nursing personnel working in NICUs show that most are female, the average age is 38, and that most are married. Regarding highest educational level, the majority had a bachelor's degree, and the average of years of service in NICU was 11 years. Part of the findings presented here coincide with studies related to the profile of nursing personnel working in NICUs in other countries (Machado, Christoffel, De Souza Tassinari, 2014, Alegre, 2011).

The scores obtained regarding the knowledge domain reflect a need to reinforce the knowledge of personnel working with premature newborns, especially regarding the following factors: nervous system of preterm babies, intraventricular bleeding, reducing time of manipulation, vital signs and adequate positioning, level of attachment (statistical analysis showed that less than 89% of participants answered the corresponding premises correctly). The results of this study match those of Alegre (2011), where some of the participants obtained the highest score in the knowledge domain. In this study, some coincidences were observed on the following domains: risk of prematurity (bleeding), pain, nervous system of premature babies, attachment and manipulation (namely, reduction of time).

None of the participants obtained the highest score in the domain of practice. These results coincide with Alegre (2011), where none of the participants obtained the highest score. The difficulty of the following premises coincides with the difficulty observed in Alegre's study: establish "silent hours", touching the baby, massage the baby and giving dextrose before a procedure. Studies show that these interventions reduce the amount of stressors in NICUs (light, noise, pain, among others). Reducing stressors favor the

development of the premature newborn and can help to reduce neurodevelopmental sequelae (Ranganath & Porus, 2011, Rugiero et al, 2008, Liaw et al., 2010, Gallegos-Martínez & Salazar-Juárez, 2010).

Regarding the attitude of nursing personnel when caring for premature newborns, few subjects obtained the highest score, for which steps should be taken to emphasize this domain. The results of this study do not coincide with Alegre (2011), where no participant achieved the highest score. The question which presented the most difficulty in this domain was related to the access of parents to NICUs. Studies point towards the importance of parents in the improvement of premature newborns (Reynolds et al., 2013, Gallegos-Martínez & Salazar-Juárez, 2010).

This study found a similarity in the domains of knowledge, practice and attitude across genders. The correlation between domains of knowledge and attitude related to years of service was not statistically significant. The results of this study regarding knowledge and years of service concur with those of Mohamed, Newton, & Lau (2014), who did not find a statistically significant relationship between years of service in NICU and knowledge regarding the skin care of premature newborns. In the study carried out by Stanley & Pollard (2013), unlike the previously mentioned study, a statistically significant relationship was found between knowledge and years of service as pediatric nurses.

This study showed statistically significant differences between the variable of practice and years of service. The fewer years of service, the better the score obtained in the practice domain, and conversely, the more the years of service, the lower the obtained score. This can be compared to the findings of Bjork & Kirkevold (1999), who found that experience itself does not guarantee positive skill development in a clinical environment.

The results of this study showed a relationship between its variables of interest, the influence of knowledge, practice and attitude of nursing personnel working in NICUs on the care and neural development of premature newborns. Previous studies show a relationship between two of these variables, such as Shrestha, Petrini, & Turaes, (2013), who found a positive correlation between knowledge and practice, or Almerco Huayanay (2014), who found a positive correlation between knowledge and attitude. Benoit & Semenic (2014), indicate that “educating NICU personnel on lactation has been linked to improvements in knowledge and attitudes related to this practice.”

In their study, Taylor, Gribble, Sheehan, Schmied & Dykes (2011) concluded that education is seen as a solution to overcome the attitudes of settled personnel. Clairat Sierra (2014) argues that “occupational skills, considered as the application of knowledge, abilities and attitudes in a work situation, allow the subject to efficiently carry out his or her functions.”

## **5. Conclusions and implications for practice**

The results of this study should not be generalized, as it was limited to a geographical zone within Puerto Rico, and generalization would require a multi-site investigation. However, findings concur with others regarding the profile of nursing personnel working in NICUs insofar as most nurses were female, and it would be interesting to broaden the research to complement this information with qualitative studies that allow us to investigate the reason behind this female tendency among nurses of NICUs. Generally, most professionals achieved high scores regarding knowledge of proper care for premature newborns, but it is nonetheless necessary to establish strategies to strengthen some aspects where NICU personnel obtained a low score.

Most personnel did not obtain high scores in the domain of practice of premature newborns, for which measures should be taken to improve this domain in relevant aspects such as how to handle a premature baby, the need for silence and minimal manipulation, as well appropriate attention and procedures to reduce and/or avoid pain. These areas should be stressed upon to improve the outcome of premature babies' neural development.

It is also necessary to improve the attitude of professionals working in NICUs regarding visiting hours and the participation of parents in the care of their children, as most studies point out the benefits of promoting the interaction of parents with newborn children to improve their health and reduce length of hospital stay. Currently, there is a trend towards a care model centered on family.

Implications for practice in this study include: the need for review of existing knowledge, as time spent performing particular work does not imply its perfect execution, for which reason it is necessary to work on the domains of practice with professionals who obtain lower scores independently of their work experience.

The statistical results allow us to conclude that there is a correlation between the variables of knowledge, practice and attitude. It is critical for nursing personnel to possess adequate knowledge, which allows them to maintain a positive attitude and in turn practice appropriate care for newborns. Nursing personnel must keep informed of new information regarding proper care of newborns and their neural development in order to reduce or eliminate health sequelae during the child's development. Continuing education for personnel in NICUs is critical, regardless of length of time working in the unit. This education must be related to the proper care of premature newborns, possible complications and nursing care proved to be effective at reducing or eliminating future complications, emphasizing adequate care to reduce stress in premature newborns and to foster early and continuous bonds with their parents.

## References

- Alegre, Fernández, G. (2011). Conocimientos, prácticas y actitud del personal de enfermería acerca de los cuidados del neurodesarrollo del recién nacido prematuro. *Revista Nacional (Itauguá) Paraguay*, 3 (2), 23-29.
- Almerco Huayanay, J. E. (2014). *Relación entre conocimientos y actitudes de las enfermeras hacia el contacto precoz madre niño en el servicio de neonatología hospital "Jorge Voto Bernales"*. (Tesis de Especialista en Enfermería en Neonatología). Universidad Nacional Mayor de San Marcos. Retrieved from [http://ateneo.unmsm.edu.pe/ateneo/bitstream/123456789/4504/1/Almerco\\_Huayanay\\_Juana\\_Elvira\\_2014.pdf](http://ateneo.unmsm.edu.pe/ateneo/bitstream/123456789/4504/1/Almerco_Huayanay_Juana_Elvira_2014.pdf)
- Als, H., Duffy, F., McCauley, G., Rivkin, M., Vajapeyam, S., Mulkern, R. & Eichenwald, E. (2004, April). Early experience alters brain function and structure. *Pediatrics*, 113 (4), 846-857.
- Benoit, B. & Semenic, S. (2014). Barriers and facilitators to implementing the Baby-friendly hospital initiative in neonatal intensive care units. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 43, 614-624. doi:10.1111/1552-6909.12479
- Bjork, I. & Kirkevold, M. (1999). Issues in nurses' practical skill development in the clinical setting. *Journal of Nursing Care Quality*, 14 (1), 72-84.
- Boat, A., Sadhasivam, S., Loepke, A. & Kurth, C. (2011). Outcome for the extremely premature neonate: How far do we push the edge? *Pediatric Anesthesia*, 21, 765-770. doi:10.1111/j.1460-9592.2010.03505.x
- Darlow, B., Zin, A., Becroft, G., Moreira, M. & Gilbert, C. (2012). Capacity building of nurses providing neonatal care in Rio de Janeiro, Brazil: methods for the POINTS of care project to enhance nursing education and reduce adverse neonatal outcomes. *BioMed Central Nursing*, 11 (3), 2-6. doi:10.1186/1472-6955-11-3
- Departamento de Salud. Secretaría auxiliar de salud familiar, servicios integrados y promoción de la salud. División madres, niños y adolescentes, sección de monitoreo, evaluación, investigación y sistemas de información. (2013). *Índice integral de la salud materna e infantil por municipios, Puerto Rico, 2010*. Puerto Rico. Retrieved from <http://www.salud.gov.pr/EstadisticasRegistrosyPublicaciones/Estadisticas20Vitales/Indice20Integral20de20la20Salud20Materna20e20Infantil20por20Municipios20PR202010.pdf>
- Fernández, L., Calderón, C. & Berrera, R. (2001). Comparación del neurodesarrollo a los dos años de vida en recién nacidos de 26 a 31 semanas de edad gestacional. *Boletín Médico del Hospital Infantil de México*, 58, 677-687.
- Gallegos-Martínez, J. & Salazar-Juárez, M. (2010). Dolor en el neonato: humanización del cuidado neonatal. *Enfermería Neurológica*, 9, 26-31.

- Jorgensen, A. (2010, June). Born in the USA - the history of neonatology in the United States: A century of caring. *NICU Currents*, 8-12.
- Kaur, R. (2013). Staff nurses (NICU) knowledge regarding care of low birth weight baby. *Journal of Nursing and Health Science*, 1 (3), 1-4.
- Kiechl-Kohlendorfer, U., Ralser, E., Pupp Peglow, U., Reiter, G. & Trawöger, R. (2009). Adverse neurodevelopmental outcome in preterm infants: risk factor profiles for different gestational ages. *Acta Paediatrica*, 98, 792-796. doi:10.1111/j.1651-2227.2009.01219.x
- Liaw, J., Yang, L., Hua, Y., Chang, P., Teng, C. & Li, C. (2012). Preterm infants' biobehavioral responses to caregiving and positioning over 24 hours in a neonatal unit in Taiwan. *Research in Nursing & Health*, 35 (6), 634-646. doi:10.1002/nur.21499
- Machado, D., Christoffel, M. & De Souza Tassinari, W. (2014). Socio-demographic profiles and qualifications of neonatal nurses in developmental care: a descriptive study. *Online Brazilian Journal of Nursing*, 13 (3), 292-301. Retrieved from <http://www.objnursing.uff.br/index.php/nursing/article/view/4718>
- Mohamed, Z., Newton, J. M. & Lau, R. (2014). Malaysian nurses' skin care practices of preterm infants: Experience vs. knowledge. *International Journal of Nursing Practice*, 20 (2), 187-193. doi:10.1111/ijn.12125
- Polkki, T., Korhonen, A., Laukkala, H., Saarela, T., Vehvilainen-Julkunen, K. & Pietila, A. (2010). Nurses' attitudes and perceptions of pain assessment in neonatal intensive care. *Scandinavian Journal of Caring Sciences*, 24, 49-55. doi:10.1111/j.1471-6712.2008.00683.x
- Primera Hora (2011). *Puerto Rico es el país con mayor número de nacimientos prematuros*. Retrieved from <http://www.primerahora.com/noticias/puertorico/nota/puertoricoeselpais conmayornumerodenacimientosprematuros-501910/>
- Ranganath R. & Porus B. (2011). *Reducing noise on the neonatal unit infant*. Retrieved from [http://www.neonatal-nursing.co.uk/pdf/inf\\_037\\_ise.pdf](http://www.neonatal-nursing.co.uk/pdf/inf_037_ise.pdf)
- Reynolds, L. C., Duncan, M. M., Smith, G. C., Mathur, A., Neil, J., Inder, T. & Pineda, R. G. (2013). Parental presence and holding in the neonatal intensive care unit and associations with early neurobehavior. *Journal of Perinatology*, 33 (8), 636-641. doi:10.1038/jp.2013.4
- Rugiero, P. E., Walton, L. R., Prieto, P. F., Bravo, A. E., Núñez, M. J., Márquez, N. J. & Mühlhausen, M. G. (2008). Efecto del masaje terapéutico en prematuros del servicio de neonatología del Hospital San José. *Revista Chilena de Obstetricia y Ginecología*, 73 (4), 257-262. doi: 10.4067/S0717-75262008000400007
- Sánchez-Rodríguez, G., Quintero-Villegas, L., Rodríguez-Camelo, G., Nieto-Sanjuanero, A. & Rodríguez-Balderrama, I. (2010). Disminución del estrés del prematuro para promover su neurodesarrollo: nuevo enfoque terapéutico. *Medicina Universitaria*, 12 (48), 176-180.

- Shrestha, S., Petrini, M. & Turales, S. (2013). Newborn care in Nepal: the effects of an educational intervention on nurses' knowledge and practice. *International Nursing Review*, 60, 205–212. doi:10.1111/inr.12017
- Sierra, Y. (2014). Calidad de la atención en el Servicio de Neonatología del Hospital General Docente "Dr. Juan Bruno Zayas Alfonso". *MEDISAN*, 18 (12), 1725-1735. Retrieved from [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S1029-30192014001200013&lng=es&nrm=iso](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1029-30192014001200013&lng=es&nrm=iso)
- Stanley, M. & Pollard, D. (2013). Relationship between knowledge, attitudes, and self-efficacy of nurses in the management of pediatric pain. *Pediatric Nursing*, 39 (4), 165-171.
- Taylor, C., Gribble, K. Sheehan, A., Schmied, V. & Dykes, K. (2011). Staff perceptions and experiences of implementing the baby friendly initiative in neonatal intensive care units in Australia. *Journal of Obstetrics, Gynecologic & Neonatal Nursing*, 40, 25-34. doi:10.1111/j.1552-6909.2010.01204.x
- World Health Organization. (2012). *Born too soon: The global action report on preterm birth*. Retrieved from [http://www.who.int/pmnch/media/news/2012/201204\\_borntoosoon-report.pdf](http://www.who.int/pmnch/media/news/2012/201204_borntoosoon-report.pdf)



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# **Design and Validation of the Questionnaire on the Initial Training Degree of Sports Coaches: QUGRAFOR<sup>®</sup>**

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**Abstract:** The main objective of this research is to carry out a preliminary survey on the training of rugby coaches. To this end, an analysis was performed using the Delphi technique from a sample of 15 experts with extensive experience in training and teaching of this sport modality. It was implemented by elaborating a questionnaire of eight dimensions which must be taken into account in the preparation of rugby trainers: demographic variable, teaching experience, initial training, conception of rugby teaching, teaching methodology, personal aspects and training needs. This questionnaire was sent to some experts: the results show that most agree with all dimensions raised and 100% of them feel the need to know their teaching experience, the reasons for practising their profession, their training needs and their willingness to update their knowledge. Only some issues concerning their experience indifferent sports, and some repetitive aspects about the coachwork have been removed.

**Key-Words:** Training, Sports, Rugby, Delphi Method, Questionnaire, Validation.

## **1. Introduction**

The sports environment is often complex and besides players, it is composed of coaches, assistants, physiotherapist and other trainers, depending on the status and wealth of the club. They create a range of relationships in a context of socializing influences and play an important role in the development and training of young people who practise sport (Keegan, Spray, Harwood, & Lavalle, 2010, Torregrosa, Cruz, Sousa, Viladrich, Villamarín &

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García Mas, 2007). One of the main factors, on which the required training of young athletes depends, is the qualification of the coach (Fraile, 1996, Fraile, Arribas, Gutiérrez, & Hernandez, 1998, Griffin & Butler, 2005, Nuviala, 2003, Nuviala, Leon Galvez, & Fernandez, 2007). His behaviour and interactions, the relationship with the players, as well as the way he communicates with them, are some of the variables which have an impact on the education of his athletes. Therefore, coaches' training is considered to be essential to ensure certain guarantees of appropriate behaviours to their athletes (Goldhaber, 2010, Manrique, Gea, & Álvaro, 2016).

Rugby is a sport which transmits high educational values and promotes individual skills (Parise, Pagani, Cremascoli, & Lafrate, 2015); however, in order to transfer these values and competences, understanding that proper education is based on the respect of the athlete's characteristics (Till, Copley, O'Hara, Cooke, & Chapman, 2014) as well as of the internal structure of the taught content is absolutely necessary. Besides, promoting the integral development of the person in cognitive, emotional, social and motor areas is essential. This must be, therefore, the basis for coaches of this sport, so that carrying out a proper teaching adapted to it. However, despite the above mentioned, there are very few surveys which reveal the benefits of rugby and training needs (Gilbert & Trudel, 2004).

This work compiles the design and validation process, an essential part of a research project whose purpose was to determine whether rugby coaches have sufficient knowledge to carry out a proper training of this sport. To achieve this, a questionnaire which could provide, as far as possible, some data on the reality of the teaching learning process received by the coaches of this sport was elaborated. The use of this questionnaire, whether done with an effective design and planning, can gather information about the object of study (Thomas & Nelson, 2007). Thus, for Rodríguez, Gil & García (1996), the questionnaire is a technique for collecting information based on the creation of previously established questions, raised in the same order and in the same way. The construction of a measuring tool like this is arduous and complicated (Padilla, Gonzalez & Perez, 1998). For this reason, we have followed the steps proposed by Martinez (2002) in order to elaborate a questionnaire:

1. Describing the information needed.
2. Writing the questions and the way to answer.
3. Writing an introductory text and the instructions.
4. Designing the formal aspect of the questionnaire.
5. Applying the questionnaire.

We opted for the development of a questionnaire with personal contact (McKernan, 1999), in which the researcher is directly related to the person who will be surveyed, making him/her complete the questionnaire.

## **2. Material and methods: the tool**

For its construction a non-experimental and cross-cutting nature design was used, whose process of collecting information is done through a survey using the questionnaire technique (Hernández Sampieri, 2014). The assessment tool was specifically designed by researchers to obtain a preliminary approach on the teachers' training in rugby among them through the Delphi methodology carried out by experts in training and coaching of this sport. For content validation, the survey sample consisted of a significant group of experts in education and training of this sport (Landeta Rodríguez, 2002). For the selection of experts, two initial selection criteria were used, based on the statement by Cabero-Almenara & Barroso-Osuna (2013): Having training experience in the field of education and specifically rugby and have minimum qualifications Level 2 as a coach.

Another important issue was choosing the number of experts who would compose the sample which would evaluate the tool. There are various positions among the authors concerning the suitable number. Finally, the decision to follow Landeta (2002) is criteria was taken. This author indicates that the number should lie between 7 and 30. Once the selection criteria have been determined, some specialists were contacted who seemed to meet them, a priori, as they were professionals and teachers of rugby. Among the professional profiles of the selected experts group we could find: Trainers and Educators of the World Rugby, former teachers of the National School of Rugby Coaches (NSRC), teachers of the Andalusian School of Rugby Coaches (ASRC), ex-coaches of the Spanish Selection of Rugby, a director of training from the National School of Referees of Rugby (NSRR), a referee from the World Rugby, graduates in physical education and a social worker. The evaluation team included a total of 15 people (86.6 per cent of men and 13.4 per cent of women). The study took into account the number of refusals to participate, as well as the number of dropouts; that is why a total of 22 experts were selected initially through purposive sampling. We got in touch individually with 15 expert judges after getting the commitment to cooperate in the process of the creation of the tool.

## **3. Procedure**

Even though the Delphi method is applied in different ways, we chose the most widely used in education, the version called "modified Delphi" (Cabero, 2014, Mengual, 2011, Murry & Hammons, 1995). In this version two consultation rounds to experts were undertaken, preventing the task being long and costly and trying to maintain adequate responses rates; and at the same time, retaining the interest of the evaluators in the attempt to ensure a trend agreements.

#### **4. Validity**

In the initial phase of this survey, a first version of the questionnaire consisting of 24 items with a combination of closed and open-ended questions was developed. The items were made focusing on 8 essential dimensions to know the characteristics of trainers' training: initial training, teaching experience, teaching conception of rugby, methodology, individual training needs, as well as demographic and personal variables.

In a second phase of work and for content validity, experts' criteria were used to test the validity of the items. This method consist in asking experts in the field about the domain which measure such items, their degree of adequacy to a particular and previous criterion set in the steps of the construct of a test (Pérez-Gil, 2000). Thus, this criterion refers to the construct justification and intended to ensure validity in terms of the theory behind the concept by which its opinion is sought. Each expert assessed the criteria for each of the questionnaire using a Likert scale, ranging from 1 (high agreement), 2 (medium degree of agreement) and 3 (Low degree of agreement), following Osterling (1989)'s criteria.

#### **5. Data analysis**

In order to carry out the statistical analysis of the obtained data, an analysis was undertaken, using descriptive statistical techniques through SPSS 15.0 (Statistical Program of Social Science) statistical package, with which frequency tables, percentages and cumulative percentages were developed. Once the survey was completed and by virtue of the results, a second version was sent back to the experts. Then, a final version (including the received answers) was elaborated, conducting the present survey. It has been registered in the Spanish Patent and Trademark Office (SPTO) under number 3536128 and QUGRAFOR<sup>®</sup> name.

#### **6. Results**

The quantitative data collected in the validation questionnaire of the questions can be seen in Figure 1 and 2. The quantitative results of the experts' total evaluations on the tool issues are reflected in Figure 1. It reveals that 84 per cent of valuations considered a "high degree of agreement" on the issues, 10.9 per cent assessed an "average degree of agreement" and finally, only 5.1 per cent of the issues were rated "low level agreement". About 95 per cent of respondents considered a high or medium degree of agreement on the total valuations.

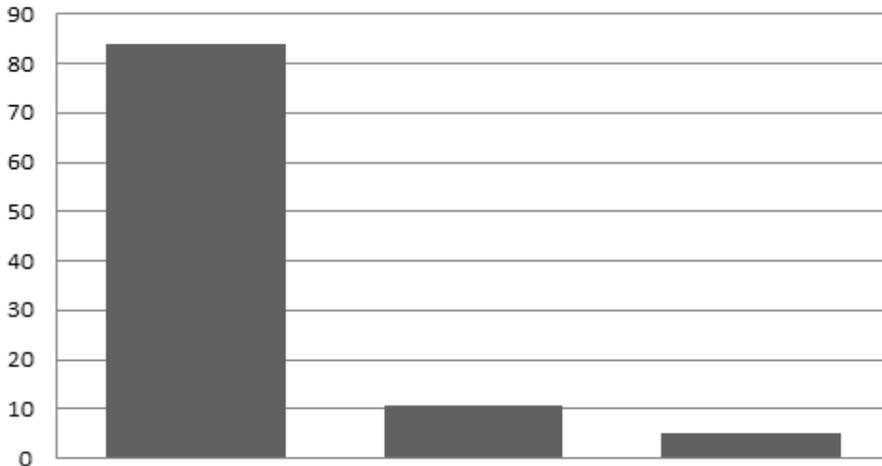


Figure 1. Overall rating of the questionnaire

The quantitative results of the questions validation can be seen in Figure 2. It shows that in every case, except in four items, more than 90 per cent of the evaluations consider a high or medium degree of agreement. The valuations generated the following average of central tendency:  $\bar{x} = 2.80$  (between half degree of agreement=2 and high degree of agreement=3), and with  $S(x)=0.18$ .

According to these results, the experts considered that the questionnaire questions were adequate in their wording, presentation, clarity, as well as in the adequacy of their response options, quantity and effectiveness in providing the required data. However, 20 per cent ( $f=3$ ) of the experts showed their disagreement with items 8, 9 and 13, and 13.33 per cent ( $f=2$ ) of the experts showed their disagreement in item 14.

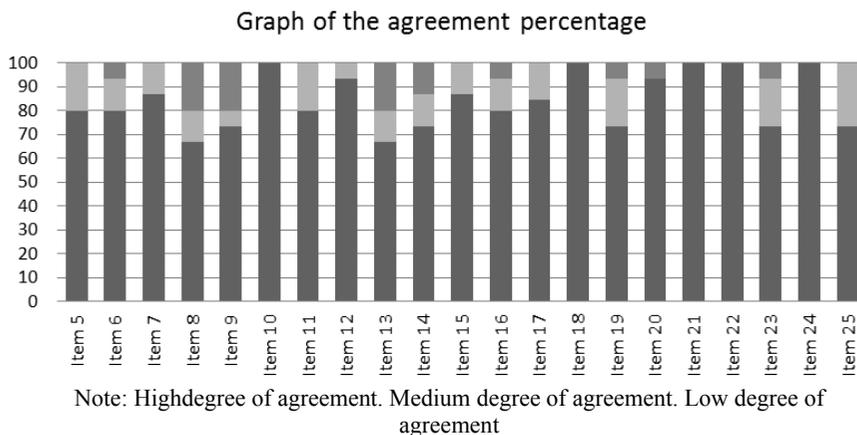


Figure 2. Agreement percentage in the items

The results of the statistical analysis of the questions can be verified in Figure 3. In all cases, the average of the experts' evaluations solve above  $\bar{x} \geq 2.47$  (between half-degree of agreement=2 and high degree of agreement=3). Among the data, we found 5 items whose average solves with the maximum score:  $\bar{x} = 3$  (items 10, 18, 21, 22 and 24), and 4 items whose average solves below  $\bar{x} \leq 2.60$  (items 8, 9, 13 and 14).

	N	Minimum	Maximum	Average	Standard deviation	Variance
University degree	15	2	3	2,80	,414	,171
Experience as a trainer	15	1	3	2,73	,594	,352
Age categories that he/she trains	15	2	3	2,87	,352	,124
Has he/she got a University degree?	15	1	3	2,47	,834	,695
Sport modality?	15	1	3	2,53	,834	,695
Has he/she been an associated member?	15	3	3	3,00	,000	,000
Highest age category headed	15	2	3	2,80	,414	,171
Highest academic degree obtained	15	2	3	2,93	,258	,067
Importance of coach 1's work	15	1	3	2,47	,834	,695
Importance of coach 2's work	15	1	3	2,60	,737	,543
Content of most useful courses	15	2	3	2,87	,352	,124
Opinions on Courses	15	1	3	2,80	,561	,314
What kind of coach did he/she learn from?	13	2	3	2,85	,376	,141
Why did he/she decide to coach?	15	3	3	3,00	,000	,000
Indicate which ones in case the answer is "others"	15	1	3	2,67	,617	,381
Improvements in the coach's Training	15	1	3	2,87	,516	,267
Would you like to continue with further training?	15	3	3	3,00	,000	,000

Attitude to continue with further training	15	3	3	3,00	,000	,000
Indicate which ones in case the answer is "others"	15	1	3	2,67	,617	,381
Content he/she suggests for courses	15	3	3	3,00	,000	,000
Indicate which ones in case the answer is "others"	15	2	3	2,73	,458	,210
Valid number (according to the list)	13					

Figure 3. *Statistical descriptions of experts' valuations.*

Although there was a good degree of consensus regarding the experts' assessment of the items raised in the questionnaire, those whose average was below ( $\bar{x} \leq 2.60$ ) were eliminated. The items which affected a high degree of consensus were preserved. The summary of the suggested changes, which have been organized according to the parts which composed the validation guide, can be seen in Figure 4.

Item 8: Have you got the academic degree in coaching in other sports different from rugby?
Item 9: If you reacted positively to the previous question, what is your sportive modality?
Item 13: How IMPORTANT do you think the FOLLOWING ASPECTS are regarding the rugby I COACH'S WORK?
Item 14: How IMPORTANT do you think the FOLLOWING ASPECTS are regarding the rugby II COACH'S WORK?

Figure 4. *Deleted items*

The following figure (Figure 5) summarizes the magnitude of changes applied to the questionnaire by comparing the variables, indicators and questions between its initial and final versions.

Dimensions	Initial Version	Final Version
Demographic variables	6 items	6 items
Teaching experience	4 items	2 items
Initial training	6 items	4 items
Lifelong training	1 item (9 questions)	1 item (9 questions)
Conception of rugby teaching	1 item (5 questions)	1 item (5 questions)
Methodology	1 item (33 questions)	1 item (33 questions)

Personal	2 items	2 items
Training needs	4 items	4 items

Figure 5. *Comparative summary between the questionnaire initial and final versions, in terms of the elements which define its design.*

## 7. Discussion and conclusions

The criteria for finalizing Delphi have to consider the extent of consensus and stability in panel answers. They guide data analysis and decision making (López Gómez, Ernesto, 2016).

The consensus "responds to the philosophy of the technique, since its main objective is precisely the convergence between the opinions of the participants" (Martínez, 2003). There is no a single way of estimating consensus (Arregui Ayatuy, Vallejo Alonso, & Villarreal Larrianaga, 1996, E. Martínez, 2003, Shah & Kalaian, 2009, Von der Gracht, Heiko A., 2012). Across the different possibilities, they can be the median or coefficient of variation because they are the most used in practice.

The quantitative results of this survey provide relevant information on expert appreciation. The most valuable ones come from the quantitative results. As we have seen above, this study shows that 8 per cent of experts' assessments consider a "high degree of agreement" regarding the issues raised, which is a good level of consensus. Although there is no universal referent, consensus can be understood as "the degree of convergence of individual estimates to a minimum of 80 per cent" (Pozo, Gutiérrez & Rodríguez, 2007). The coefficient of variation provided by the experts' answers ( $S(x)=0.18$ ) also indicates a high degree of consensus concerning the issues raised in the tool, since for (Shah & Kalaian, 2009) this coefficient is the most adequate test for this type of studies. Once the questionnaire structure was established, after the second consultation with the experts, the final design of the instrument was elaborated in telematic version, being its link: <http://bit.ly/1EGNx4Y>.

From the validity and reliability processes carried out with the designed instrument, it can be established that QUGRAFOR questionnaire can be used in the field of physical education and sports science teaching because it has the optimal levels of reliability and validity to evaluate the level of training, learning needs, updating processes, the conception of teaching methodology and its practical application, as well as the demographic variables of rugby coaches.

Finally, it is necessary to mention that this new tool, which did not exist previously, can involve opening up future lines of work in different training actions of rugby coaches which are taught worldwide, to ensure that these are more appropriate to needs reality of those who are interested in teaching and learning this sport.

## References

- Arregui Ayatuy, G., Vallejo Alonso, B., & Villarreal Larrianaga, O. (1996). Aplicación de la metodología delphi para la previsión de la integración española en la unión económica y monetaria. *Investigaciones Europeas de Dirección y Economía de la Empresa*, 2 (2), 13-37.
- Cabero Almenara, J. (2014). Formación del profesorado universitario en TIC. aplicación del método delphi para la selección de los contenidos formativos. *Educación XXI*, 17 (1), 109-132.  
doi:<http://dx.doi.org/10.5944/educxx1.17.1.10707>
- Cabero Almenara, J., & Barroso Osuna, J. (2013). La utilización del juicio de experto para la evaluación de TIC: El coeficiente de competencia experta. *Bordón. Revista de Pedagogía*, 65 (2), 25-38.
- Fraille, A. (1996). Reflexiones sobre la presencia del deporte en la escuela. *Revista de Educación Física. Renovar la Teoría y la Práctica*, 64, 5-10.
- Fraille, A., Arribas, H., Gutiérrez, S., & Hernández, A. (1998). La salud y las actividades físicas extraescolares. En M. Santos y A. Sicilia (dir.). *Actividades físicas extraescolares. Una propuesta alternativa* (pp. 53-62). Barcelona: INDE.
- Pérez-Gil, J.A. (2000). *Proyecto docente: Psicometría I*. Universidad de Sevilla.
- Gilbert, W. D., & Trudel, P. (2004). Analysis of coaching science research published from 1970–2001. *Research Quarterly for Exercise and Sport*, 75 (4), 388-399.
- Goldhaber, D. (2010). Licensure tests: Their use and value for increasing teacher quality. En Kennedy, M. (ed.) *Teacher assessment and the quest for teacher quality: A handbook* (pp. 133-147). San Francisco: Jossey-Bass.
- Griffin, L. L., & Butler, J. I. (2005). *Teaching games for understanding: Theory, research and practice*. Champaign I. L.: Human Kinetics.
- Hernández Sampieri, R. (2014). *Metodología de la Investigación* (6ª ed.). Mexico: McGraw-Hill/Interamericana Editores, S.A.
- Keegan, R., Spray, C., Harwood, C., & Lavalle, D. (2010). The motivational atmosphere in youth sport; coach, parent, and peer influences on motivation in specializing sport participants. *Journal of Applied Sport Psychology*, 22 (1), 87-105.
- Landeta Rodríguez, J. (2002). *El método delphi: Una técnica de previsión del futuro*. Barcelona: Ariel.
- López Gómez, E. (2016). El método delphi: Fundamentos teóricos y metodológicos. *Educación XXI* (in press),
- López, E. G., & Cabero-Almenara, J. (2011). Diseño y validación de un cuestionario dirigido a describir la evaluación en procesos de educación a distancia. *Edutec: Revista Electrónica de Tecnología Educativa*, (35), 5.

- Manrique, J. C., Gea, J. M., & Álvaro, M. (2016). Perfil y expectativas del técnico de deporte escolar en el municipio de segovia (españa). *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte*, 13 (50), 367-387.
- Martínez, E. (2003). La técnica delphi como estrategia de consulta a los implicados en la evaluación de programas. *Revista de Investigación Educativa*, 21 (2), 449-463.
- Martínez, F. (2002a). *El cuestionario. Un instrumento para la investigación en las ciencias sociales*. Barcelona: Laertes.
- Martínez, F. (2002b). *El cuestionario: Un instrumento para la investigación en las ciencias sociales*. Barcelona: Laertes.
- McKernan, J. (1999). *Investigación-acción y curriculum: Métodos y recursos para profesionales reflexivos*. Madrid: Ediciones Morata.
- Mengual, S. (2011). *La importancia percibida por el profesorado y el alumnado sobre la inclusión de la competencia digital en educación superior*. Alicante: Departamento de Didáctica General y Didácticas Específicas de la Facultad de Alicante.
- Murry, J. W., & Hammons, J. O. (1995). Delphi: A versatile methodology for conducting qualitative research. *The Review of Higher Education*, 18 (4), 423.
- Nuviala, A. (2003). *Las escuelas deportivas en un entorno rural aragonés: El caso del servicio comarcal ribera baja*. Zaragoza: Gobierno de Aragón.
- Nuviala, A., León, J. A., Gálvez, J., & Fernández, A. (2007). Qué actividades deportivas escolares queremos: Qué técnicos tenemos. *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte*, 7 (25), 1-9.
- Osterling, S. J. (1989). *Constructing Test Items* Boston: Kluwer Academic.
- Padilla, J. L., González, A., & Pérez, C. (1998). Elaboración del cuestionario. *En Rojas, Fernández y Pérez (ed.), Investigar mediante encuestas. fundamentos teóricos y aspectos prácticos* (pp. 115-140). Madrid: Síntesis S.L.
- Parise, M., Pagani, A., Cremascoli, V., & Lafrate, R. (2015). Rugby self-efficacy and prosocial behaviour: Evidence from italian "rugby project for schools". *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, 10 (1), 57-61.
- Pozo, M. T., Gutiérrez, J., & Rodríguez, C. (2007). El uso del método delphi en la definición de los criterios para una formación de calidad en animación sociocultural y tiempo libre. *Revista de Investigación Educativa*, 25 (2), 351-366.
- Rodríguez, G., Gil, J., & García, E. (1996). *Metodología de la Investigación cualitativa*. Málaga: Aljibe, S.L.
- Shah, H. A., & Kalaian, S. A. (2009). Which is the best parametric statistical method for analyzing delphi data? *Journal of Modern Applied Statistical Methods*, .8 (1), 226-232

- Thomas, J. R., & Nelson, J. K. (2007). *Métodos de investigación en actividad física*. Barcelona: Paidotribo.
- Till, K., Copley, S., O'Hara, J., Cooke, C., & Chapman, C. (2014). Considering maturation status and relative age in the longitudinal evaluation of junior rugby league players. *Scandinavian Journal of Medicine & Science in Sports*, 24 (3), 569-576.  
doi:<http://dx.doi.org/10.1111/sms.12033>
- Torregrosa, M., Cruz, J., Sousa, C., Viladrich, C., Villamarín, F., García Mas, A., & Palou, P. (2007). La influencia de padres y madres en el compromiso deportivo de futbolistas jóvenes. *Revista Latinoamericana de Psicología*, 39 (2), 227-237.
- Von der Gracht, Heiko A. (2012). Consensus measurement in delphi studies. *Technological Forecasting and Social Change*, 79 (8), 1525-1536.  
doi:<http://dx.doi.org/10.1016/j.techfore.2012.04.013>



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# **Integration of ICT in the Mexican Higher Education: The Case of the Virtual Environments of Learning**

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**Abstract:** The face of modern society is technology based life, and education is not apart form that. Thus, there is a need for reflection, analysis and decision making when it comes to inserting information and communication technologies to the teaching-learning process in schools and higher education institutions. In Latin America, this change in the paradigm of education has been slowly changing and particularly in Mexico a good number of Universities and other Higher education Institutions have started addressing the challenge. Although there is still a long way to go on the virtualization of programs to become available for a good number of future uses, it is time to start directing their efforts to that particular area. This paper presents a revision on pedagogical aspects, functions, and necessities when implementing Information and Communication Technologies (ICT) in Higher Education Institutions in Mexico and may also serve as a reflection exercise that can lead to facilitate and improve the programs and courses to come.

**Key-Words:** Information and Communication Technologies, Higher Education Institutions, Virtual Learning Environments, Educational Management, Mexico.

## **1. Introduction**

Our corrent society has been undoubtedly affected by the constant changes. The economy, culture, education and other social aspects have been influenced by globalization and the implementation of Information and

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communication technologies ICT. It has even been pointed out by UNESCO (2005) that there is a need for strengthening one's capacity to identify, produce, disseminate, use and deal with information in order to create and apply such knowledge to human development. The amount of information generated by the different sources available has contributed to create a more complex scenario. Castells (1999) states that the use of ICT is partially responsible for new ways of dealing with the processes associated to the collection and retrieval of information. Since distance shortens, other forms of communication arise along with different types of relationships between subjects whether it is synchronous or asynchronous.

Therefore, by overcoming space and time limitations, some features of our time emerge; flexibility, adaptability, and the capacity of survival to continuous changes are some of the characteristics of having ICT at their peak. Nevertheless, there is one more feature that needs to be highlighted: the social network, where collaboration is the key to build knowledge.

The use of ICT in the different areas of human activities is more and more frequent and so it is the case in education. Teaching – Learning Processes (TLP) are enhanced by the use of technology based tools that improve knowledge acquisition, whether it is individual or collaboratively, working in situ, blended or completely online.

For educational purposes, ICT have been considered as a pace downprocess. According to Moreno (2010) it is possible to identify three uses in education: quantitatively, if you only take into account the infrastructure or accessibility. The second, that has to do with the use of ICT in the TLP and finally the third, as a tool to find out more or research about interactions among subjects or the mastery of ICT. For UNESCO (2008) the level of technology appropriation is looked up by three main approaches: the first has to do with basic knowledge on ICT so students and teachers can start incorporating them to the TLP. The second is referred to the use of ICT to deepen into diverse issues that can be enriched through the use and implementation of them either individually or collaboratively. Finally, the third approach is about building knowledge with the participation of teachers and learners by different activities that promote creativity, innovation and critical thinking.

This paper offers a perspective of what is appears to be intended in a virtual learning Environment in some Higher Education institutions in Mexico along with some reflections on the features and their impact in education.

## **2. Virtual learning environments**

It is feasible to state that there is a semantic and pragmatic difference to what is understood as a virtual learning environment in Spanish, since there are two terms that are referred or related to the idea of what “an environment

entitles”. However, the first term includes the features of the second and as a practicality they are presented indistinctively in the following review.

An environment is referred by the Oxford dictionary as “the setting or conditions in which a particular activity is carried on” (2017). When it comes to the teaching-learning process (TLP), an educational context includes the physical, psychological and social frames where students learn (Martínez-Otero, 2000). It is also described as a dynamic system that includes the teacher’s behavior and their interaction with students as well as the interactions among students (Gómez, Valle & Pulido, 189). An environment implies the interactions of human beings in their natural and social surroundings and it is necessary a degree of awareness which can serve as a support towards the world and their existence. The previous means necessarily the use of language, culture, and some forms of communication that go deeper to what occurs in the mastery of life (Freire, 2006).

Sauve (1994) defines an environment as “a group of internal, biological-chemical factors along to the correspondent external, physical – psychosocial ones that promote or interfere social interaction. According to this author, there are dimensions of human interaction and perception that overlap. Such phenomenon corresponds to a proper “cosmovision” for a community, which integrates different perspectives that might be inclusive or complementary. In this scenario, the environment is the main source for research.

Human beings relate to their environments through a historical –cultural process by adapting or transforming themselves in some sort of symbolic correlation that interprets reality permanently (Díaz & Gómez, 2005).

In education, an environment is usually related to learning in a sort of active conception that involves the pedagogical actions that affect the learner and its interactions with the environment as such (Raichvarg in Duarte, 2003).

A learning environment for Naranjo & Torres (1996) and Pergolis (2000) is a dynamic interaction in an “educational city” where a human being is part of the process so it is necessary to examine intrinsic and extrinsic elements of the teaching learning process. In a learning environment, pedagogical actions are oriented so that learners can reflect on their own and others outcomes and relate them to their environment (Duarte, 2003).

Ospina (1999) offers a constructive view where a learning environment requires a permanent building on what forms part of the process. Cano and Lledó (1995) go further postulating some indispensable principles to create appropriate learning environments: a) establish the conditions for group cohesion towards common objectives, b) an environment as a way that allows interaction with different activities oriented to cognitive and social affective learning ; offer diverse scenarios to stimulate learning; d) offer, sub-scenarios that allow learners to feel accepted with their personal features and e) the environments identity reflects the group identity.

According to Chaparro (1995) the physical aspect of an environment which constitutes its historical-cultural context includes: (...) the dynamics in

educational processes such actions and experiences of each one of the participants; attitude social affective- material conditions, multiple relationships with the context and the necessary infrastructure to concrete cultural objectives that become explicit in every educational proposal.

For the authors of this paper an environment is more than the physical space that surrounds and wraps up human interaction. It represents a historical-cultural context that it is created and transformed by its participants in a process that influences the subject

Therefore a VLE is assumed as:

- A systematic, organized, but malleable and adaptable place that allows heuristic development, and the use of metacognitive skills, attitudes and emotions. A place for learning transference to the student (Mayer, 2000).
- A space that favors autonomous learning as a capacity to be in charge of one's learning (Holec, 1981) taking into account their personal features in a self-regulated, intentional, accumulative, constructive process that promotes the interaction, collaboration and cooperation of the learners, along with values development.
- An active learning model that allows the building of meaningful knowledge preferably based on real experiences with learners (Ausubel, 1976).
- A setting that promotes human exaltation by the development of one's capacities and commitment with their society in order to reach their maximum potential as human beings (Zilberstein & Olmedo, 2016).

### **3. ICT and VLE**

Human relationships are not restricted to physical interactions anymore. It is a current fact that the virtual being is recognized and taken into consideration for the creation of a new way of social interaction. A cyber-culture has become a media-relational universe, a space for a new language and new interactions (Martin-Barbero, 2002).

Therefore, there is a need to identify and describe the implications for the teaching-learning process since apart from the written-oral expressions, iconic language becomes relevant. Visual processing and thinking seem to be an important issue for VLE's so there is a need for pedagogical-didactic foundation when making decisions about content structures and learning objectives. The new roles for students, teachers, tutors, and facilitators need to be considered in compliance with this new order. Furthermore, it is important to find out whether they are native, or digital immigrants that need to adapt to this new environment (Prensky, 2001); or in other aspect related if they are residents use to internet tools or visitors, skeptical of online expressions (White & Le Cornu, 2011).

This new context affects original conditions for education. Television and Internet have changed the way of presenting information to children and adults. Martin-Barbero (2002) considers that visual knowledge is responsible for a cultural disorder that dismisses and illegitimizes teacher and school's authority. Moreover, many times the quality of contents is poor and are not purpose oriented.

Thus, a virtual learning environment (VLE) is taken as a group of criteria and processes to allocate a course so that it is possible to learn. The design has to leave its regular linear –sequence based form to become a dialectic constructive spiral which would reflect awareness upon the educational motives and the activities related to it. There is as well a constant assessment and a dismemberment of the sequence so it can be much more flexibility and creativity (Quiñones, 2006). The new organization goes further from technological elements and cultural representations, participant's interactions, economic and political matters.

In a VLE the possibility of interaction is established by more natural conditions for new generations. It is possible to sort out and line up information, the time and speed that an individual wants to study the contents.

Pedagogically speaking it is important to establish some principles to understand and adapt to this new form of learning. Constructivism assumes that the environment is a fundamental element in the human development of a learner. The subject is the result of the interactions between the inner self and the environment; therefore, the construction of a human being is associated to interactions with the environment (Carretero, 1997).

According to Quiñones (2006) the pedagogical principles that should be considered in the management and development of VLE are the following:

- An appropriate balance between knowledge and communication privileging the relationship over quantity. The design of learning objects has to be oriented to offer a socio-cultural appropriation that can lead to meaningful learning.
- Technology should be used to develop new pedagogical devices that allow the construction of competencies in collaborative environments with no-linear structures, associative and hierarchical that incorporate a diversity of sources and synchronous and asynchronous communication.
- The use of learning objects that present real world problems that enable students to take control of their process of instruction so by analyzing and synthesizing, through induction-deduction, abstraction- concretion, modeling and going from historical-logical can be able to make sense of experiences to build knowledge.
- The use of cognitive support strategies such as tutoring, role-modeling, guided learning where a learning platform is the way of constructing their own knowledge representation with freedom, flexibility as opposed as the traditional, rigid, schematic use in some teaching environments.

As it was stated previously, in Spanish there are two terms that refer to an environment, one that is included in the other. López, Escalera & Ledesma (2002) offer a group of conditions that belong to the term that subsides as part of the general concept of virtual learning environments as follows:

- A knowledge environment that comes from a curriculum design that are presented as contents as well as learning objects with interactive-adapted features.
- A collaboration environment, where interaction happens and it is also referred as feedback that can be synchronous or asynchronous.
- A counseling environment where tutoring is given to students from learning facilitators in a personalized way.
- An experimentation environment that serves as a complement of the contents to provide a vivid face if necessary.
- The management environment that is related to the control of the pedagogical process, the school and how students interact with it.

The authors of this papers have a perspective based on the general systems theory (Bertalanffy, 2006) due to the fact that it is possible to identify a supra system that represents the general environment where VLE are inserted. There is also an under system that is part of this VLE system and have features that follow an integrated structures in a logical-sequenced that point out to previously established objectives.

From this view, there are two types of elements that intervene in different moments of a sequence that is systematic a cyclic as follows:

- Objects: learning objects, ICT and LMS, contents, management, attitudes, autonomy, self-regulation, critical thinking, knowledge building, etc.
- Subjects: specialists (pedagogue, designers, experts in contents and ICT management), students, counselors (facilitators or teachers) and society. (See figure 1).

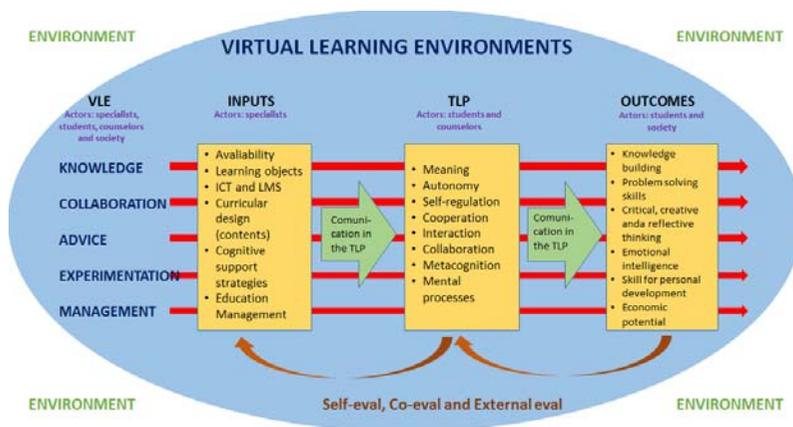


Figure 1. VLE from a systems approach

#### **4. VLE features in the Mexican context.**

As many universities in the world that have been moving towards virtual learning, Mexico has started to look has been increasing the number of higher education institutions that have been offering resources based on ICT as well as complete undergraduate and graduate programs where VLE are offered.

According to Bustos & Coll (2010) the use of ICT can be observed at different levels:

- a) As a complement of the teaching-learning process.
- b) To present specific contents.
- c) As a tool to support some contents in a specific manner.
- d) They are disseminated among students thanks to its portability.
- e) The connection takes place in a network.

The analysis of the use of ICT in Higher education is not an easy task but it represents the interest that has raised in the world in the last years. There have been some doubts from both teachers and students to incorporate ICT in the teaching-learning process. Diaz Barriga (2013) proposes that such process can be classified in three kinds of tendencies; in the first teachers are trained in the use of ICT. The second is oriented to the management of contents that can be used by teachers and students online, and the third, where ICT are seen from an integral perspective that has a psycho-pedagogical foundation and not only technologically speaking. In this case, it is important to take into consideration the different aspects that students might be affected by such as their age, their interests and others and based on that proceed to the design of didactic sequences that can help them to build their knowledge whether it is individually or collaboratively. In this way, previous knowledge of each participant can be taken into account and go from individual islands to knowledge networks.

Silvio (2004) considers important to transit from a traditional teaching learning paradigm to one that is oriented to learning by building one where a teacher becomes a guide, a facilitator of learning through the creation of virtual learning communities (VLC) that are horizontal relationships in synchronous or asynchronous form to favor the construction of knowledge networks among classmates and teachers.

To expand on the previous, Badía (2006) states the use of ICT on its own does not contribute to generate constructivist practices in the TLP. In this way, it is fundamental to have a clear intention along with appropriate planning where the some components are taken into account. First the conception of teachers from a guidance, mediation, facilitator function; students from an active role so they can be the lead actor in the construction of their learning. The contents included in courses and the form that are designed; and finally the use of ICT articulately for teachers and students.

De Souza (2007) sustains that the educational market is targeted by the Information Society and an economy based in knowledge, where the use of

ICT generates a new way of management. That new way differs from the relationship that is set among subjects, the information and knowledge, as well as the generation of collaboration networks, new pedagogies and new ways of spreading scientific knowledge.

Some studies carried on by Ersad, Gilje and Arnseth (2013) predicate that the main challenges that the XXI century society faces are the processes that allow the comprehension of the interconnections that take place among subjects, networks and communication processes that happen synchronously or asynchronously from the use of ICT. Therefore the information becomes knowledge by identifying, using, analyzing and transferring to other contexts where can be relevant.

Cassany (2012), highlights some meaningful changes that take places on the teaching learning process where ICT are present. Mainly it has been increasing the amount of information that is available, which can be seen in different formats, although there are no filters to assess their pertinence.

On the other hand, Llamas, Hoyos & Sifuentes (2015) expands on how the new contexts have completely changed the impact in the educational ambits and the concept of learning has become dynamic, it does not have a unique, true or definite value, but has been changing, evolving and enriching. Nevertheless, the notion of context has expanded and not only includes on site, partially on site or completely virtual and so that teaching-learning processes are built in each one of these situations.

Going through the previous approaches about incorporating ICT in the society in general and particularly in the educational ambit, it is relevant to insist that higher education institutions (HEI) have generated changes in their professional development offer, which have allowed them to respond to the demands of current society. From this perspective, Rama (2014) analyzes the process of incorporation

Of ICT in Universities, where it stands up the fact that the coverage of education has increased and how such phenomena serves people. Some have been inserted

On semi onsite programs while people who work have become a virtual user an also even face to face programs have adopted ICT in their courses. In this process of rethinking higher education in Latin America, Rama (2014) considers that distance education starts operating in the late 70's with the creation of partially on site models in places like Mexico, Equator, Colombia, Venezuela and Costa Rica. Some of the most important examples are "Universidad abierta y a distancia in Mexico (UNAD), Universidad Técnica Particular de Loja in Equador (UTPL), Universidad Nacional de Costa Rica (UNA) and Instituto Tecnológico de Estudios Superiores de Monterrey in México (ITESM).

Currently in México there are a number of institutions private and public that have adopted the virtual model: Universidad Virtual de la Universidad de Guadalajara (public), Universidad Virtual del Estado de

Guanajuato (public), Consorcio Clavijero del Estado de Veracruz (public), Universidad Virtual del Estado de Michoacán (public), Universidad Mexicana en Línea (private), Instituto Tecnológico de Monterrey Virtual (private), Universidad Autónoma del Estado de Hidalgo en la modalidad virtual (public), Universidad DaVinci (private), Universidad Tecnológica Privada en Línea UTEL (private), among many others that might have recently adopted the model.

The following models are present in most virtual universities in Mexico:

- Flexibility: the student has the freedom to organize the pace and time he/she dedicates to do his/her tasks and homework.
- Inclusiveness: students who find difficult to attend on site schools can participate in the programs.
- Cutting edge technology for education: virtual platforms are use such as Moodle, Sakai and Blackboard.
- Availability: students can sign in to do their tasks depending on their schedules since it is an asynchronous model.
- Interactivity: this type of programs can have synchronous or asynchronous activities such as chats or wikis and can be done working individually or collaboratively.
- Employability: students reinforce their professional competencies and improve their performance in the workplace thanks to the contents and tasks proposed in the courses.

Summarizing, in virtual models firstly, students develop skills and attitudes that are looked for and valued by employers and corporations, secondly; students are oriented to the development of enterprising in different contexts by putting their procedural, attitude and concept based knowledge into work.

## **5. Considerations when implementing a VLE**

An effective VLE must comply with pedagogical objectives that can impulse broader objectives in the HEL (known in Management terms as vision and mission principles). Therefore, it is necessary to measure performance and how the investment time-benefit is working (Sanchez, 2015).

Following the General systems approach, assessment must take place in broader and diverse directions. All the elements should be able to be measured in order to correct errors and understand success in others so they can be replicable so that a virtuous cycle can take place. Although, it is insufficient to concentrate efforts in measuring academic performance or in drop out levels in this type of courses. Measurement then should have a global character.

There have already been efforts to measure the quality for online education and there are several models to do so. Vetya & Rendón (2014) analyzed the subject and identified the best recurring practices among such models: institutional leadership, the management of teaching – learning

processes, students and teachers' support, the development of courses, ICT, capacities and effectiveness of costs assessment. In terms of assessment of VLE courses, it is proposed to consider four procedural perspectives that can be important and decisive in order to reach objectives. According to Kaplan & Norton (2014) It is important to clarify that such perspectives are presented in a sequence that is key to management since it is necessary to cover the first so the second can take place and so on, (see figure 2).



Figure 2. *Perspectives for measuring the effectiveness of BSC-based AVA.* Source: *Adapted from Kaplan & Norton (2014)*

The perspectives are described as follows:

a) Learning- growth perspective: where are included human capital management and knowledge management. That means organizational culture, training and workers development, knowledge management, systems for memorizing and organizational learning and human development in general. From this perspective it is important to address the question: under what condition are working the people in charge of developing these processes.

b) Processes perspective: in this case, it is important to concentrate the efforts on what are found to be the key processes of the system, those who add value and are the source of sustainable competitive advantages. A poorly defined and structured procedure may never be performed successfully. Teaching- Learning processes would be mainly be a productive process that needs to be defined and refined along with those support processes that make the first possible.

c) Customer/ client perspective: it is about seeing the students as external customers so that their satisfaction can be taken into account and be measured. The measurement contrast their expectations with the service rendered.

d) Economical/ Financial perspective: it is a very important view but it is only possible if the other ones have been accomplished. It is about identifying how effective the use of the resources and benefits has resulted.

This is not something exclusive in private institutions since public schools have committed to provide the best service available. All the previous perspectives have a direct and irrevocable impact on this one.

The advantages of this model are represented in the vision and strategies that each institution can use as key factors that can be measured and quantifiable to link and communicate specific objectives or actions. Moreover, it leads to an increase in the feedback to the system. For this purpose it is necessary to generate a key factors outline for each one of the perspectives, those bare variables that inform about the operation or behavior of a given activity in the institution. The factors are also defined as (...) “the relationship of qualitative and quantitative variables that let us observe the evolution or change of tendencies in the object or phenomena observed in concordance with the objective or goals foreseen or expected influences “ (Selltiz in Bermúdez & Rodríguez, 2013).

Defining key factors for the institution can serve the purpose of identifying and making unique a model adopted by an HEI assuming that they are adopted in an innovative well organized form. Such factors should come from the objectives of the Institution and be able to be analyzed in numbers that can increase or decrease. All members of the institution must know the model and participate in the definition of the factors they have assumed as key to reach their goals and agreed to. It is suggested that they can be equilibrated in number and importance among all perspectives depending on the characteristics of each institution.

Once the key factors for VLE in HEI are decided and defined it is important to include in the model of implementation a way of assessment and continuous improvement so it can be easily and effectively replicable to other HEI with similar resources or features.

## **6. Conclusions**

Technology based models for education are a part of our modern society so it is important to continue analyzing in what ways and to what extent they can be inserted effectively and purposefully. Therefore, it is mandatory that every participant in the teaching-learning process can be aware of it and prepared to understand the changes to traditional models that is implicit.

Pedagogical processes need to be adapted to serve the same purpose but in many different forms. VLE offer limitless possibilities but face us with a great deal of challenges. More and more every aspect of human development is being transformed thanks to the insertion in a virtual reality that started with the use of the internet.

The use of ICT in education offers the possibility to get more with less resources, which can enable students from different social spheres to be included, promoting a more democratic reach for higher education. As for a theoretical perspective of the implementation of ICT, the constructive model

offers an interesting approach since it considers the environment a vital part of the learning process. Although, there are still some aspects in education and pedagogy that need to be addressed.

One of those important matters is the amount of training for students and teachers that is necessary as well as the resources needed to maximize the outcomes. Finally, it is necessary to say that the previous analysis offers only a few elements that should be taken into consideration for the understanding and implementation of successful VLE in Mexico. It is a fast growing area and many other features are arising all over the world, so it is a must to continue expanding on the matter so it would be possible to offer the best available model to present and future users.

## References

- Ausubel, D. (1976). *Psicología educativa: Un punto de vista cognoscitivo*. México: Trillas.
- Bermúdez, L. T. & Rodríguez, L. F. (2013). *Investigación en la gestión empresarial*. Bogotá: ECOE Ediciones.
- Bertalanffy, L. V. (2006). *Teoría general de los sistemas: fundamentos, desarrollo, aplicaciones*. México: Fondo de Cultura Económica.
- Badía, A. (2006). Enseñanza y aprendizaje con TIC en la Educación Superior. Presentación. *RUSC. Revista de Universidad y Sociedad del Conocimiento*, 3 (2), 1-4. Retrieved from <http://www.redalyc.org/pdf/780/78030207.pdf>
- Bustos, A. & Coll, C. (2010) Los entornos virtuales como espacios de enseñanza y aprendizaje. Una perspectiva psicoeducativa para su caracterización y análisis. *Revista Mexicana de Investigación Educativa*, 15 (44), 163-184. Retrieved from <http://www.redalyc.org/pdf/140/14012513009.pdf>
- Cano, M. I. & Lledó, A. (1995). *Espacio, comunicación y aprendizaje*. Sevilla: Diada.
- Carretero, M. (1997). *Constructivismo y educación*. México: Progreso.
- Castells, M. (1999). *La sociedad red*. México: Alianza Editorial.
- Cassany, D. (2012). *En línea. Leer y escribir en la red*. Barcelona: Editorial Anagrama.
- Chaparro, C. I. (1995). *El ambiente educativo: condiciones para una práctica educativa innovadora*. Tunja: CINDE-UPTC.
- De Souza, B. (2007). *La Universidad en el Siglo XXI. Para una reforma democrática y emancipadora de la Universidad*. Bolivia: CIDES-UMSA.
- Díaz, R. & Gómez, M. (2005). Representaciones del ambiente y organización social del espacio. Caso: Comunidad del sector “Chino Julio” del Municipio Maracaibo del Estado Zulia, Venezuela. *Espacio Abierto*, 14

- (4), 609-629. Retrieved from <http://www.redalyc.org/pdf/122/12214406.pdf>
- Díaz Barriga, A. (2013). TIC en el trabajo del aula. Impacto en la planeación didáctica. *Revista Iberoamericana de Educación Superior*, 4 (10), 3-21. doi. <http://www.redalyc.org/articulo.oa?id=299128588003>
- Duarte, J. (2003). Ambientes de aprendizaje. Una aproximación conceptual. *Estudios Pedagógicos*, 29, 97-113. doi. <http://dx.doi.org/10.4067/S0718-07052003000100007>
- Erstad, O., Gilje, O. & Arneseth, H. C. (2013). Vida de aprendizaje conectadas: Jóvenes digitales en espacios escolares y comunitarios. *Comunicar*, 40 (20), 89-98.
- Faure, E., Herrera, F., Kaddoura, A.-R., Lopes, H., Petrovski, A., Rahnema, M. & Ward, F. (1973). *Aprender a ser. La educación del futuro*. París: UNESCO. Retrieved from <http://unesdoc.unesco.org/images/0013/001329/132984s.pdf>
- Freire, P. (2006). *Pedagogía de la autonomía. Saberes necesarios para la práctica educativa*. México: Siglo XXI editores.
- Gómez, D., Valle, A. & Pulido, M. (1989). Evaluación y estructura del clima socioescolar en alumnos de EE.MM. de Galicia. *Revista de Psicología General y Aplicada*, 92 (3), 367-376.
- Holec, H. (1981). *Autonomy and foreign language learning*. Oxford: Oxford University Press.
- Llamas, V. T., Hoyos, C. A., & Sifuentes, A. T. (2015). Ambientes educativos móviles aplicados para la educación superior. *Episteme*, 2 (3) Retrieved from <http://186.46.158.26/ojs/index.php/EPISTEME/article/view/143/102>.
- López, A. E., Escalera, S. & Ledesma, R. (2002). Ambientes virtuales de aprendizaje. *Presimposio Virtual SOMECE 2002*. México: SOMECE.
- Martín-Barbero, J. (2002). *La educación desde la comunicación*. Bogotá: Norma.
- Martínez-Otero, V. (2000). *Formación integral de adolescentes: educación personalizada y programa de desarrollo personal (PDP)*. Madrid: Fundamentos.
- Mayer, R. (2000). Diseño Educativo para un aprendizaje constructivista. En C. Reigeluth (ed.). *Diseño de la instrucción. Teorías y modelos. Un paradigma de la teoría de la instrucción* (pp.153-171). Madrid: Siglo XXI.
- Norton, D. P., & Kaplan, R. S. (2009). *El cuadro de mando integral*. Barcelona: Planeta.
- White, D. S., & Le Cornu, A. (2011). Visitors and Residentes. A new typology for online engagement. *First Monday*. Retrieved from <http://firstmonday.org/article/view/3171/3049>.

- Moreno, T. (2010). Competencias en educación. Una mirada crítica. *Revista Mexicana de Investigación Educativa*, 15(44), 289-297. Retrieved from <http://www.scielo.org.mx/pdf/rmie/v15n44/v15n44a17.pdf>
- Motta, N. (1995). Reflexiones Antropológicas para un modelo de desarrollo alternativo y sostenible en la costa pacífica vallecaucana. *III Congreso Latinoamericano de Ecología, Simposio Educación Ambiental para el Manejo de los Territorios*. Mérida, Venezuela. Retrieved from: <https://rubieltmontoya.files.wordpress.com/2014/08/reflexiones-antropolc3b3gicas-para-un-modelo-de-desarrollo-alternativo-y-sostenible-en-la-costa-pacifica-vallecaucana.pdf>
- Naranjo, J. & Torres, A. (1996). *Ciudad educativa y pedagogías urbanas*. Bogotá: Dimensión educativa.
- Ospina, H. F. (1999). *Educación, el desafío de hoy: construyendo posibilidades y alternativas*. Bogotá: Magisterio.
- Pergolis, J. C. (2000). *Relatos de ciudades posibles. Ciudad educadora y escuela, la práctica significante*. Bogotá: Fundaurbana.
- Premsky, M. (2001). Nativos o inmigrantes digitales. *On the Horizon*, 9(5), 1-6. Retrieved from [http://www.marcprensky.com/writing/Premsky-nativos20e20inmigrantes20digitales20\(SEK\).pdf](http://www.marcprensky.com/writing/Premsky-nativos20e20inmigrantes20digitales20(SEK).pdf)
- Quiñones, J. (2006). Fundamentos Pedagógicos en Entornos Virtuales de Aprendizaje. En Consejo Nacional de Acreditación, *Entornos Virtuales en la Educación Superior* (pp. 55-58). Bogotá: Consejo Nacional de Acreditación.
- Real Academia Española (2014a). *Concepto de ambiente*. Retrieved from <http://dle.rae.es/?id=2HmTzTK>
- Real Academia Española (2014b). *Concepto de virtual*. Retrieved from <http://dle.rae.es/?id=buDJhh3>
- Rama, C. (2014). La virtualización universitaria en América Latina. *Revista de Universidad y Sociedad del Conocimiento*, 11(3), 33-43.
- Sánchez, A. (2015). Dimensión económica de la educación: eficacia y eficiencia. *Educando para Educar*, 16(30), 63-76.
- Sauve, L. (1994). Exploración de la diversidad de conceptos y de prácticas en la educación relativa al ambiente. *Memorias Seminario Internacional la Dimensión Ambiental y la Escuela*. Bogotá: Documentos Especiales MEN.
- Secretaría de Educación Pública (2008). *Acuerdo número 445 por el que se conceptualizan y definen para la Educación Media Superior las opciones educativas en las diferentes modalidades*. México: Autor.
- Serrano, M. d. (2010). Objetos de Aprendizaje. *Revista e-Formadores*, 1-5. Retrieved from [http://red.ilce.edu.mx/sitios/revista/e\\_formadores\\_oto\\_10/articulos/angeles\\_serrano\\_nov10.pdf](http://red.ilce.edu.mx/sitios/revista/e_formadores_oto_10/articulos/angeles_serrano_nov10.pdf)
- Silvio, J. (2004). Tendencias de la Educación Superior en América Latina y el Caribe. En IESALC, *La Educación Superior virtual en América Latina y el Caribe* (pp. 5-27). México: ANUIES.

- UNESCO (2005). *Hacia las sociedades del conocimiento*. Francia: ONU.
- UNESCO (2008). *Estándares de competencia en TIC para docentes*. Retrieved from <http://www.oei.es/tic/UNESCOEstandaresDocentes.pdf>
- Veytia, M. G. & Rendón, F. (2014). Medición de la calidad en la educación en línea: Un modelo sugerido en base a la perspectiva de los clientes. *VII International GUIDE Conference 2014 Cultural Identity in the Midst of Global Modernization: The Role of Distance Education*. Ciudad de Guatemala, Guatemala.
- Zambrano, M. F. (2000). El córtex digital: Posibilidades de desarrollo cognitivos en los nuevos espacios virtuales. En UPN, *Relaciones y tensiones entre investigación e innovación en educación* (pp. 141-174). Bogotá: Universidad Pedagógica Nacional.
- Zilberstein, J. & Olmedo, S. (2016). Didáctica desarrolladora, enfoque desde el enfoque histórico-cultural. *Educação e Filosofia Uberlândia*, 29(57), 61-93 <http://dx.doi.org/10.14393/REVEDFIL.issn.0102-6801.v29n57a2015-p61a93>



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# **Impact of Osteoarthritis in the Quality of Life of Elderly Patients: Challenge on Professional Healthcare Formation and Practice**

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**Abstract:** In Puerto Rico, a country with a large elderly population, it is imperative for healthcare professionals and students in nursing and related health fields to be duly trained with the necessary skills and competencies to deal with this growing population. Rethinking of care plans, responsibilities, models and interventions must be reinforced to accomplish healthcare needs of the geriatric sector. This is an ineludible challenge in elderly caregiving. This quantitative study with a transversal, descriptive design was carried out with elderly patients of osteoarthritis located in the Metropolitan area of San Juan, Puerto Rico. Its objective was to identify the possible relationship between osteoarthritis and the quality of life of this population. The representative sample consisted of 380 elderly patients, 36.6% male and 61.3% female. Eight participants did not specify their gender (2.1%). A relationship was found between osteoarthritis and quality of life. Namely, this condition was found to have a negative impact in the quality of life of elderly patients. Poverty and lack of treatment options are aspects to consider, whereas the most affected areas are the hands and knees, impairing mobility and patients' ability to carry out activities of their daily living. This affects both their independence and daily coexistence, with a greater impact on women. This aspect of gender should be further scrutinized in future investigations. Aging population, particularly those with a chronic disease such as osteoarthritis, impose more and new challenges in the formation of health care students and the professional practice in general.

**Key-Words:** Nursing Education, Management, Nursing Competencies, Degree, Quality of Life, Elderly Patients, Osteoarthritis.

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## 1. Introduction

Approximately 40 million people in the United States, including Puerto Rico, suffer from some form of arthritis, the most common being osteoarthritis. The Center for Disease Control (CDC, 2015) points out that osteoarthritis, also known as osteoarthrosis, is a common type of arthritis: a chronic disease affecting the joints, particularly those involved in constant movement, it occurs due to attrition and destruction of joint surfaces. For the purposes of this study, we will refer to osteoarthritis as a type of degenerative arthritis affecting the joints.

Depending on the stage of osteoarthritis, this disease can severely impair the affected individual's ability to carry out activities of daily living. The resulting pain from this disease causes limited motion, reduced physical capability, restriction of social activities, and compromised work capacity (Agency for Healthcare Research & Quality, 2002). If the different forms of arthritis are left medically unattended, many patients are completely incapacitated, as they are unable to find and follow a treatment course which would allow them to continue their lives as normally as possible (Ley #120 de Puerto Rico, 2004). Patients often do not seek proper treatment for their arthritis due to lack of knowledge of treatment options.

Therefore, it is imperative for government authorities to reach out to citizens regarding this preventable situation and its timely treatment. Preventative treatment can avoid the severe consequences of this disease when it becomes a chronic ailment (Ley #120 de Puerto Rico, 2004).

This disease, which involves pain and progressive functional degeneration, is a common ground for medical consultation which incurs in high costs and often implies a decrease in quality of life. Studies have shown that up to 50% of people with symptomatic arthritis suffer from some degree of impairment which makes it impossible or highly difficult to execute their daily chores. Currently, research on osteoarthritis in the United States has used radiographic, symptomatologic and clinical markers to identify the disease.

Puerto Rico follows the guidelines developed by the United States to diagnose and treat osteoarthritis. These guidelines are endorsed by the Rheumatologist Association of Puerto Rico (Lopategui Corsino, 2013). Some of the risk factors for osteoarthritis are: aging, family history (genetics), obesity, gender (women show more predisposition), hormonal state (women), ethnicity (Asians and Caucasians show more predisposition). Secondary or weak risk factors include occupation, physical activity, muscular weakness, early menopause, post-oophorectomy, diabetes and hypertension.

However, in Puerto Rico, there are no exact statistics concerning the location of osteoarthritic joints in patients of this disease, one of the most common among the elderly population (National Institute of Arthritis and Musculoskeletal & Skin Diseases, 2013). This fact called for a profound study

of this disease, outlined in this article, whose general objective was to identify a possible relationship between osteoarthritis and quality of life in the elderly population. Moreover, the following specific objectives were established:

1. Estimate the prevalence of the different types of osteoarthritis among a sample of the elderly population of Puerto Rico.
2. Identify the relationship between osteoarthritis and quality of life in the studied sample of the elderly population.
3. Establish the relationship between degree of autonomy or independence, quality of life, gender and location of the osteoarthritic joints in the sample under study.
4. Determine the relationship between cohabitation, gender and quality of life in a sample of elderly patients of osteoarthritis.

This topic is important because there is no cure for osteoarthritis. The treatment route is to reduce the effects of this pathology, modify its progress and delay its consequences in patients' life. This paper serves as a contribution to enlighten about osteoarthritis in the Puerto Rican context. In addition, it can be helpful for healthcare professionals, including professional nurses, which constitute fundamental figures contributing to comprehensive care for the elderly population. The findings of the present study provide valuable information that empowers to promote a humanized and appropriate care starting at the onset of the formation of nursing students to ensure they have the knowledge, competencies and skills to provide quality, efficient and secure care for osteoarthritis patients. The results also serve as additional evidence for faculty supervisors, which must provide proper education for future professionals to meet the corresponding challenges, emphasizing reflection, critical thinking and prioritization (Iglesias-Parra et al., 2015), in this case concerning the needs and nursing care required by the elderly population and osteoarthritis patients.

## **2. Method**

This study is of a quantitative, transversal, descriptive design and included questionnaire administration. Transversal research is designed to measure the prevalence and/or result of exposure in a specific population at a particular point in time. It is useful to assess health care needs and to plan service provision, particularly important for chronic conditions which require medical attention during their development (Polit & Tatano, 2006).

### **2.1. Population and Sample**

The studied population consisted of osteoarthritis patients aged 65 years or older. Sampling was simple and random, representing the population of osteoarthritic patients in San Juan, Puerto Rico. In this Metropolitan area, according to primary care or rheumatologic data, 14,400 elderly patients are

estimated to seek osteoarthritis treatment on an annual basis. The researcher visited the chosen clinics and the instruments for data gathering were administered to 380 patients. According to the formula for determining sample size for research activities used by Krejcie and Morgan (1970), a sample of approximately 375 participants was required to achieve a 95% confidence interval in generalizing to the given population.

## 2.2. Instruments and Variables

The measurement instruments and studied variables are outlined below:

*Sociodemographic questionnaires.* A document the researcher developed to gather the following information regarding the participants: gender, age, civil status, level of education, household composition (including place of residence and with whom the participant lives), occupation, financial income, healthcare plan, location of osteoarthritic joints, amount of time with the disease and medication taken.

*Medical Outcome Study Short Form Health Survey questionnaire (SF-36 v2).* Used to assess the quality of life of surveyed participants according to the subject's perception of their general health status, as reflected by eight dimensions distributed among two components: Physical Health Component: Physical function (2), role-physical (2), bodily pain (1) and general health (2). Mental Health Component: Social function (1), role-emotional (2), mental health (2) and vitality (1).

The response options are presented in a Likert scale evaluating intensity or frequency. The amount of possible options ranges from three to six, depending on the item. The total raw scores calculated by each component were transformed to scores which went from 0 (worst state of health for the corresponding dimension) to 100 (best state of health). Scores superior or less than 50 points indicate a good or poor quality of life, respectively. Cronbach's Alpha for this instrument fluctuates between 0.79 and 0.96 (Alonso, Prieto & Anto, 1995).

*Barthel test.* This test was used to measure degree of dependence (no autonomy) or independence (total autonomy) of surveyed participants regarding the following daily activities: feeding, showering, dressing, toilet use including defecation and urination, walking, climbing/descending stairs and transferring (mobility). This test is the most widely used scale to provide a functional assessment of patients with acute pathologies, and is particularly useful in rehabilitation settings. The response categories of disability in each activity were defined and rated in scale steps (0, 5), (0, 5, 10), (0, 5, 10, 15) dependent on the item. The maximum overall score possible is 100 points. The scores were interpreted as follows: less than 20 points indicate total dependency (no autonomy); 20-35 indicate grave dependency (mild autonomy); 40-55 indicate moderate dependency (moderate autonomy); more than 60 is mild dependency (high autonomy); and a 100 points score is classified as an independent person (total autonomy). Cronbach's Alpha for

this test fluctuates between 0.86 and 0.92 (Cid-Ruzafa & Damián Moreno, 1997).

### 2.3. Procedure

Formal authorization was obtained for the use of assessment instruments and from the Institutional Review Board. Clinical visits were coordinated and participants recruited through a promotional sheet. Instruments were administered from August to October, 2015.

### 2.4. Statistical Analysis

The statistical package SPSS® 20 was used for data analysis. Central tendency and dispersion measures were calculated, as well as frequencies and percentages. Pearson correlations and multivariate analysis through logistic regression were carried out in order to establish the relationship between the variables in this study.

## 3. Results

### 3.1. General Profile of Participants

Of the 380 surveyed participants aged 65 or older, 61.3% were female. The age range was 65 to 97, with an average of 75. 71.8% indicated they were not married (single, divorced or widowed). 37.9% had college-level education and 36.1% just had a high school diploma. 62.1% were retired, 20.8% were housekeepers and 8.7% still worked. 35.8% indicated living alone, while 64.2% cohabited. Of these, 22.6% lived with their spouses, 23.1% lived with one or more family members and eight participants (2.1%) lived with someone who was not a family member. 16.6% lived in retirement homes. 67.9% indicated monthly incomes of \$1,000 or less, while 6.3% indicated no income. 79.5% had Medicare, whether by itself or in combination with another healthcare or insurance plan. Sociodemographic data examined by gender revealed variables associated with economic status were lower for women (Table 1).

	<b>Gender</b>		<b>Total</b> <i>f (%)</i>
	<b>Male</b> <i>f (%)</i>	<b>Female</b> <i>f (%)</i>	
Marital status ( <i>n</i> = 367)			
Married	40 (29.9%)	60 (25.8%)	100 (27.2%)
Not married (single, divorced or widowed)	94 (70.1%)	173 (74.2%)	267 (72.8%)

<b>Occupation (n=367)</b>			
Housewife	14 (10.3%)	64 (27.7%)	78 (21.3%)
Retired not working	92 (67.6%)	139 (60.2%)	231 (62.9%)
Employed	18 (13.2%)	15 (6.5%)	33 (9.0%)
Other	12 (8.8%)	13 (5.6%)	25 (6.8%)
<b>Monthly income (n= 372)</b>			
Less than \$500	24 (17.3%)	78 (33.5%)	102 (27.4%)
\$501 to \$1,000	60 (43.2%)	88 (37.8%)	148 (39.8%)
\$1,001 to \$2,000	34 (24.5%)	41 (17.6%)	75 (20.2%)
\$2,001 to \$3,000	10 (7.2%)	8 (3.4%)	18 (4.8%)
More than \$3,000	3 (2.2%)	2 (0.9%)	5 (1.3%)
No income	8 (5.8%)	16 (6.9%)	24 (6.5%)
<b>Healthcare coverage (n=371)</b>			
Health Reform Plan	19 (13.7%)	28 (12.1%)	47 (12.7%)
Private plan	5 (3.6%)	16 (6.9%)	21 (5.7%)
Medicare	24 (17.3%)	39 (16.8%)	63 (17.0%)
Combined coverage	89 (64.0%)	147 (63.3%)	236 (63.6%)
None	2 (1.4%)	2 (0.9%)	4 (1.1%)

Table 1. *Distribution of sampled elderly population in Puerto Rico sociodemographic description by Gender.*

The most common medication taken for osteoarthritis was acetaminophen (64.7%), followed by natural supplements (49.2%) and ibuprofen (47.9%). Medicines such as Celecoxib, Nabumetone or Meloxicam were used by less than 20% of participants. Upon examination of medicine consumption by gender, a greater percentage of women were found to use acetaminophen (67.8%) and natural supplements (51.1%). Men used more ibuprofen (50.4%), Celecoxib (18%) and Nabumetone (15.8%) than women (47.2%, 12%, 9%, respectively).

### 3.2. Prevalence of different types of osteoarthritis

For the purposes of this study, type of osteoarthritis refers to the affected area(s) by this pathology; this is the location of the osteoarthritic joints.

The participants can select more than one joint, if necessary. 79.5% indicated having osteoarthritis in more than one area of their body or

generalized to all areas of the body. 70.6% of participants indicated suffering from this disease for 1 to 10 years. 17.9% had been diagnosed with this severe disease more than 10 years ago.

The prevalence of osteoarthritis in knee and hand joints was most noteworthy, at 57.1% and 44.7%, respectively (Table 2). Other areas affected by osteoarthritis were the hips and shoulders, approximately 30% each, as well as the neck, lower back and ankles. 20% of the sample indicated having all areas affected by osteoarthritis.

Type of osteoarthritis (affected area)	Degree of autonomy		
	Some degree of autonomy <i>f</i> (%)	Autonomy <i>f</i> (%)	Total <i>f</i> (%)
Shoulders	25 (22.3%)	87 (32.5%)	112 (29.5%)
Hips	45 (40.2%)	68 (25.4%)	113 (29.7%)
Hands	36 (32.1%)	134 (50.0%)	170 (44.7%)
Knees	52 (46.4%)	165 (61.6%)	217 (57.1%)
Other areas	5 (4.5%)	4 (1.5%)	9 (2.4%)
All areas of the body	48 (42.9%)	28 (10.4%)	76 (20.0%)

Table 2. Distribution of sampled elderly population in Puerto Rico by location of osteoarthritic joints (affected area) and degree of autonomy

The prevalence of osteoarthritis in the knees was greater for women (63.1%) when compared to men (47.5%), a statistically significant difference ( $\chi^2$ : 8.66,  $p < 0.003$ ). As regards hand joints, the condition equally affected both genders, with 45.3% of men and 44.2% of women affected. Having all areas affected by osteoarthritis was more common for men than for women, with 25.9% and 15.9%, respectively ( $\chi^2$ : 5.54,  $p < 0.019$ ). Elderly participants who expressed having only one area affected by osteoarthritis were younger than those who indicated having all areas of their body affected (Figure 1).

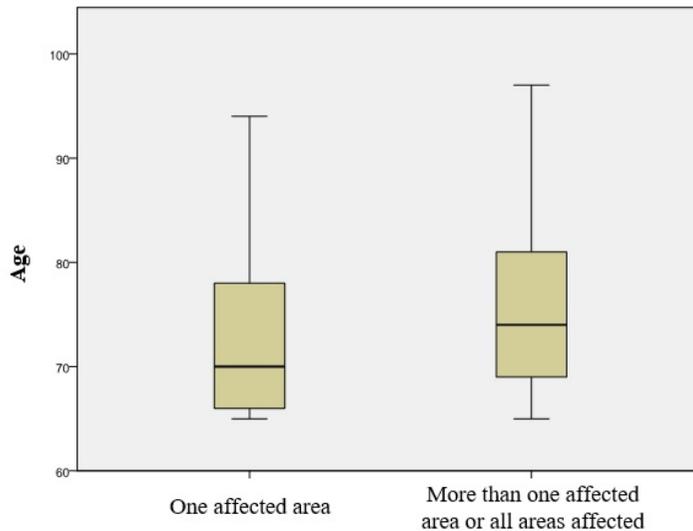


Figure 1. Age of sampled elderly population in Puerto Rico and their amount of areas affected by osteoarthritis.

#### 3.4. Relationship between osteoarthritis and quality of life

Quality of life was measured according to two main scores corresponding to: 1) the physical health component and 2) the mental health component. An overall score of the general state of health was calculated. Elderly participants indicated a poor quality of life, both generally (59.5) and physically (69.5%). As for their mental health, similar percentages were seen for both good (44.2%) and poor (43.4%) options.

53.8% of elderly participants who indicated having only one area affected by osteoarthritis indicated a good quality of life, whereas those with more than one area affected by osteoarthritis (63.6%) manifested a poor quality of life (presenting a risk 3.05 times as great,  $CI$  95% 1.6-5.7,  $p < 0.0001$ ).

Moreover, we found that the more years the participant had suffered from the condition, the more severe was the detriment in their quality of life (Table 3). Conversely, the fewer years the patient had suffered with the condition, the better his or her quality of life.

Years experiencing osteoarthritis	Quality of life			
	Poor <i>f</i> (%)	Regular <i>f</i> (%)	Good <i>f</i> (%)	Total <i>f</i> (%)
Less than 1 year	12 (35.3%)	1 (2.9%)	21 (61.8%)	34 (100.0%)
1 to 5 years	64 (45.1%)	6 (4.2%)	72 (50.7%)	142 (100.0%)
6 to 10 years	86 (68.3%)	5 (4.0%)	35 (27.8%)	126 (100.0%)
More than 10 years	59 (86.8%)	3 (4.4%)	6 (8.8%)	68 (100.0%)
Total	221 (59.7%)	15 (4.1%)	134 (36.2%)	370 (100.0%)

Table 3. Distribution of surveyed sample of elderly population in Puerto Rico by level of quality of life and years experiencing osteoarthritis

The pathology's course of development conditions the quality of life of the elderly population with osteoarthritis. Every year of further development increases the risk for a worse quality of life (2.63 *CI* 95% 1.96-3.51,  $p < 0.0001$  for a poor quality of life; 1.98 *CI* 95% 1.04-3.76,  $p < 0.035$ ).

3.5. Relationship between degree of autonomy, quality of life, gender and location of osteoarthritic joints.

Regarding the degree of autonomy, 71.2% male and 70.4% female participants indicated being independent.

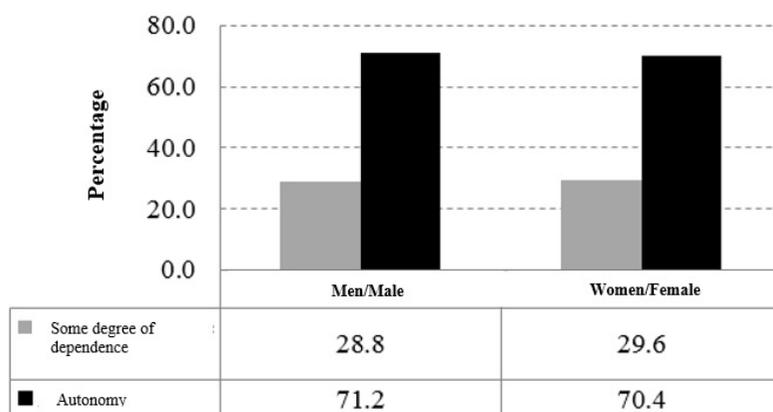


Figure 2. Percentage distribution of sampled elderly population in Puerto Rico by gender and degree of autonomy.

The Pearson correlation coefficients ( $r$ ) for quality of life and components of physical and mental health revealed a significant, positive correlation between degree of autonomy and quality of life. All Pearson coefficients were higher than .540 at a significant level ( $p < .01$ ) (Table 4). Namely, the greater the autonomy or independence, the greater the quality of life as reflected as much by physical and mental health as well as in general terms.

Variable	Autonomy	QoL	PHC	MHC
Degree of autonomy (Autonomy)	1	.588**	.586**	.544**
Quality of Life (QoL)		1	.962**	.961**
Physical Health Component (PHC)			1	.850**
Mental Health Component (MHC)				1

Note: \*\* $p < 0.01$  (bilateral)

Table 4. *Pearson's Correlation Coefficients matrix for degree of autonomy and quality of life for sampled osteoarthritis, elderly patients in Puerto Rico*

Upon carrying out the instrument analysis by dimension, the highest correlations were seen between degree of autonomy, role-physical ( $r=.550$ ) and physical function ( $r=.532$ ). Similarly, we found a significant  $p$  value across four mental health dimensions ( $p < .0001$ ). Women who suffered from osteoarthritis indicated either total or a high level of autonomy, whereas a significant amount of men indicated being completely autonomous. This is followed by a practically equal distribution of men with moderate or high autonomy. Therefore, gender does not condition degree of autonomy.

In addition, we found that the location of osteoarthritic joints conditioned the patient's degree of autonomy ( $r=-.168, p < .01$ ). If the affected area was the whole body, the hips or various areas, less autonomy was indicated ( $p < 0.0001$ ). Moreover, the analysis revealed that age conditioned the degree of autonomy, a statistically significant finding ( $r=-.462, p=0.0001$ ). Older patients expressed a lower degree of autonomy; the older the person, the smaller the degree of autonomy ( $r=-.498, p=0.0001$ ). The only variable related to degree of autonomy was age (Figure 3). We found that cohabitation status (where the participant lived and with whom) was related to the degree of autonomy ( $r=.266, p=.0001$ ) and, therefore, with the need for health care.

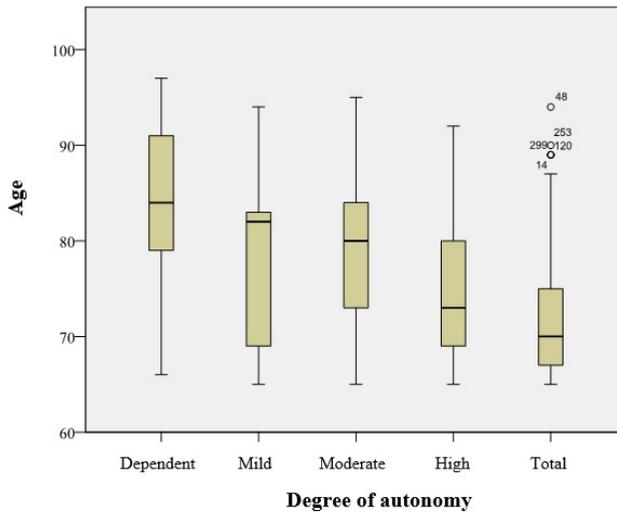


Figure 3. *Self-assessment of degree of autonomy for sampled elderly population in Puerto Rico as relates to age.*

### 3.6. Relationship between cohabitation, gender and quality of life

Cohabitation refers to where and with whom the patient lives. Under this study, it was found that cohabitation conditioned quality of life when taking gender into account (Figure 4). This was more notable among the group of elderly women with osteoarthritis.

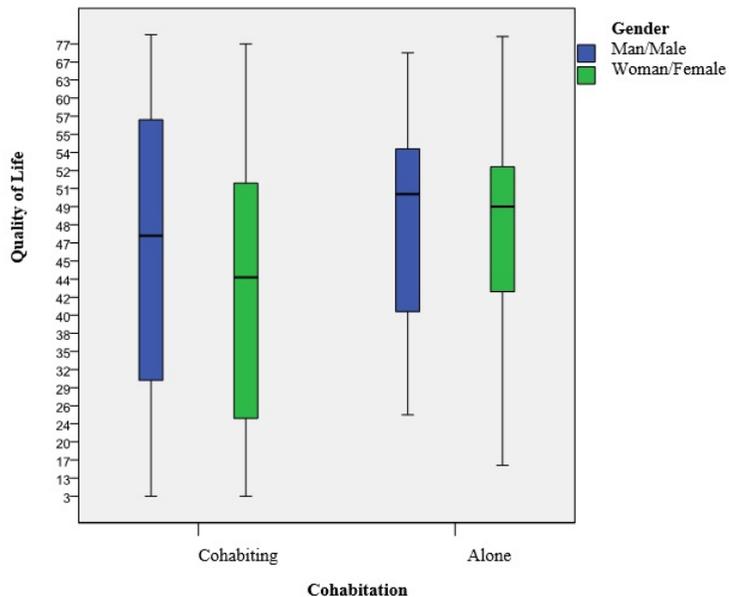


Figure 4. *Quality of life of sampled elderly population in Puerto Rico as relates to gender and cohabitation status.*

Distribution by cohabitation, gender and quality of life reflects no significant correlation for surveyed men, but a significant correlation for women. Women who cohabited as well as those who lived by themselves reflected a poor quality of life. Level of dependence, age, years experiencing osteoarthritis and being female all increased the risk of patients for a decreased quality of life (Table 5).

	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>Dof</b>	<b>Sig.</b>	<b>Exp(B)</b>	<b>CI 95% for EXP(B)</b>	
							<b>Inferior</b>	<b>Superior</b>
Degree of dependence	3.081	.612	25.318	1	.000	21.774	6.558	72.291
Age	.060	.021	7.857	1	.005	1.062	1.018	1.107
Years experiencing osteoarthritis	.395	.172	5.257	1	.022	1.485	1.059	2.082
Female gender	.615	.268	5.260	1	.022	1.849	1.094	3.127
Constant	-5.693	1.487	14.663	1	.000	.003		

Table 5. Multivariate analysis of predicting factors involved in quality of life.

#### 4. Conclusions

The present study reveals a profile of oligo or polyarthritic elderly patients which healthcare is covered by Medicare and are living at a high level of poverty, which does not necessarily allow them to access medicine to appropriately treat this condition and with women's quality of life being more severely affected. According to literature, it is common for the probability of oligo or polyarthritic to increase with age, where more than two joints are affected by the disease (Martínez, 2000). Existing literature points out chronic conditions, such as osteoarthritis, worsen the economic state of elderly people who have this disease, as most of them only have Medicare coverage. Poverty implies two main difficulties for this population: transportation to medical appointments to receive necessary prescriptions and the cost of deductibles in the treatment of osteoarthritis. This in turn implies that elderly patients resort to non-prescription medicine and do not receive proper treatment for their condition. This increases the degeneration of mobility, particularly in the knees and hands, which are the most affected joints in the Puerto Rican osteoarthritic population. The finding that women were most affected by this condition coincides with Martínez (2000), who observed that most elderly

osteoarthritic patients are women; sometimes up to 75% having this disease as compared to men.

The prevalence of the type of osteoarthritis in the elderly population in Puerto Rico is varied. However, the prevalence of osteoarthritis in knees and hand joints were most noteworthy in the studied sample. This coincides with the findings of Dohery et al. (2006) and Walker (2011), who pointed out that osteoarthritis often affects hands, hips and joints. Having osteoarthritis affecting various parts of the elderly patient's body implies a greater impact on their overall health. This is consistent with other studies (Arthritis Foundation, 2014; Castell et al., 2015; Loeser, 2010) which found that the prevalence of osteoarthritis increases with age, being more common in people over 65 and affecting both men and women.

The prevalence of osteoarthritis in the knees was greater in women when compared to men. However, men were more prone to have all areas of the body affected when compared to women. Regarding this point, the Center for Disease Control (CDC, 2015) indicates aging, being a woman and hormonal state (in women) as primary risk factors involved in osteoarthritis predisposition. Moreover, experts on this topic have found that aging and continuing degeneration of joints frequently related to work can have a greater effect on one part of the body than others. Therefore, when one area of the body is more severely affected than another, it can be linked to the type of activity and work the patient with this condition carries out on a regular basis (Ray, 2014; Grupo de Investigadores de Osteoporosis, 2015).

Elderly people in Puerto Rico showed that the fewer years the patient had suffered from the condition, the greater his or her quality of life. Massardo (2009) and Yildirim, Ulusoy & Bodur (2010), among other researchers, found that people with this painful disease tend to be less active, and its effects are not limited to physical health. People who have arthritis also tend to suffer a degradation of their mental health. Osteoarthritis is a disease which involves pain and progressive functional limitation.

In general, the studied group indicated a poor quality of life. Góngora Cuenca et al. (2006) had similar results, indicating that the most affected areas as regard quality of life and the health of elderly affected patients are mobility, personal care, daily chores and pain. None of the surveyed osteoarthritis elderly patients indicated an optimal state of health. Studies carried out by Ambril Murillo, Menor Almargo, Campos-González and Cardiel (2014) point out that the quality of life in patients with osteoarthritis or any other type of arthritis is poor and similar to patients with chronic diseases.

Most of the surveyed participants, regardless of gender, indicated total autonomy or a high level of autonomy. Mora, Araya and Ozols (2004) found a significant correlation between the variable of autonomy, social support and physical activity. Most of the surveyed sample lived with their family or unrelated people. Despite their age and osteoarthritis, the elderly Puerto Rican has to struggle against pain, trying to survive in a postmodern society.

Culturally, elderly people do not like to be considered a “burden” for anyone, so they seek to carry out daily chores by themselves with the least amount of help possible or without any help at all. Elderly people who have led productive lives do not like losing their independence, and maintaining a positive attitude in spite of the disease and continually struggling to overcome limitations helps the osteoarthritic patient deal with this condition. Disease management is oriented towards maintaining the greatest level of independence possible without putting the person at risk (Arthrolink, 2015).

In this study, a significant, positive correlation was found between degree of autonomy and quality of life. The Elderly Affairs Office (“Oficina de la Procuradora de Personas de Edad Avanzada”) (2009) points out that Independence encompasses various aspects, including not just physical but emotional and economic independence, which allows the elderly person to feel useful in a society oriented towards production and which disparages old age. In a study conducted by Sève-Ferrieu (2009), researchers found a correlation between degree of independence, autonomy and quality of life. People feel more satisfied and reflect a higher level of wellbeing when they are able to carry out daily chores by themselves. Particular attention should be paid to the elderly, whose gradual loss of physical and mental capacity implies a negative impact on their quality of life, in order to appropriately attend to their needs.

The quality of life in women is most dramatically affected, whether living alone or cohabiting. Puerto Rican women are at a high risk of being widowed due to their higher life expectancy when compared to men. According to IndexMundi (2015), in Puerto Rico general life expectancy at birth was 79.09, with men averaging 75.46 years and women 82.8 years. The role of women in Puerto Rico, particularly those over 65 years old, is very traditional: women are generally in charge of house maintenance including cleaning and cooking in spite of their old age and ailments, which places them at a higher risk of disease degeneration and of having more bouts of pain (Acosta Belén, 1980). Culturally, men tend to be more passive regarding daily chores and self-maintenance when they get sick, depending more on women or other family members. Therefore, the topic of gender is an important one for future investigations.

The results and conclusions of this study are important for professionals prepared and authorized to provide services to this population in order to provide quality care, as well as for students in training. The demands of aging population, in particular of those with a chronic disease such as osteoarthritis, impose new challenges in the formation of health care students and the professional practice. In a country with a large and living longer elderly population, it is imperative for healthcare professionals and students in nursing and related health fields to be duly trained with the skills and competencies to deal with this growing population. Key areas of rethinking are the care plans, responsibilities, models and interventions that must be reinforced to accomplish healthcare needs of this geriatric sector. It is

important to remember that teachers have a crucial responsibility towards students to communicate a commitment to this population through a realistic, contextualized approach to the needs regarding quality of life and independence affecting the elderly patient with osteoarthritis. This is an ineludible challenge in elderly caregiving.

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## References

- Acosta Belén, E. (1980). *La mujer en la sociedad puertorriqueña*. Río Piedras, PR: Ediciones Huracán.
- Agency for healthcare research and quality. Managing osteoarthritis: Helping the elderly maintain function and mobility. *Research in action*, 4. Retrieved from <http://archive.ahrq.gov/research/findings/factsheets/aging/osteoria/index.html>
- Alonso, J., Prieto, L., & Anto, J. M. (1995). Spanish version of SF-36 Health survey (Health survey SF-36): Un instrumento para la medida de los resultados clínicos. *Revista Medicina Clínica*, 104 (20), 771-776.
- Ambriz Murillo, Y., Menor Almagro, R., Campos-González, I., & Cardiel, M. (2014). Calidad de vida relacionada con la salud en artritis reumatoide, osteoarthritis, diabetes mellitus, insuficiencia renal terminal y población geriátrica: Experiencia de un hospital general en México. *Reumatología Clínica*, 11 (2). doi: 10.1016/j.reuma.2014.03.006
- Arthritis Foundation (2014). *Osteoarthritis*. Retrieved from <http://espanol.arthritis.org/espanol/disease-center/osteoarthritis/>
- Arthrolink. (2015). *El estado de ánimo y su influencia en la osteoarthritis*. Retrieved from <http://www.arthrolink.com/es/vida-cotidiana/consejos-practicos/mantener-el-animo>
- Castell, M. V., van der Pas, S., Otero, A., Siviero, P., Dennison, E., Denkiner, M. & Deeg, D. (2015). Osteoarthritis and frailty in elderly individuals across six european countries: results from the european project on osteoarthritis (EPOSA). *BMC Musculoskeletal Disorders*, 16, 359. Retrieved from <http://doi.org/10.1186/s12891-015-0807-8>
- Center for disease control and prevention, CDC (2015). *Osteoarthritis*. Retrieved from <http://www.cdc.gov/arthritis/basics/osteoarthritis.htm>
- Cid-Ruzafa, J., & Damián-Moreno, J. (1997). Valoración de la discapacidad física: El índice de Barthel. *Revista Española de Salud Pública*, 71 (2), 127-137. Retrieved from [http://www.scielosp.org/scielo.php?script=sci\\_arttext&pid=S1135-57271997000200004&lng=en&tlng=es](http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S1135-57271997000200004&lng=en&tlng=es)

- Doherty, M., y Lanyon, P., & Ralston, S. (2006). Musculoskeletal disorders. In N. Boon, N. Colledge, B. Walker, et al. (Eds.). *Davidson's principles & practice of medicine* (20<sup>th</sup> edition). London: Churchill Livingstone.
- Góngora Cuenca, Y. L., Friol González, J. E., Rodríguez Boza, E. M., González Roig, J. L., Castellanos Suárez, M., & Álvarez Acosta, R. (2006). Calidad de vida en pacientes con osteoartritis de cadera y rodilla. *Revista Cubana de Reumatología*, 8 (9-10), 23-42.
- Grupo de Investigadores de Osteoporosis (2015) Grupo de Investigadores de Osteoporosis (GRIO). (2015). *La osteoporosis y la osteoartritis: factores de riesgo*. Retrieved from <http://www.grio.org/>
- Iglesias-Parra, M. R., García-Guerrero, A., García-Mayor, S., Kaknani-Uttumchandani, S., León-Campos, Á, & Morales-Asencio, J. M. (2015, April 9). Design of a competency evaluation model for clinical nursing practicum, based on standardized language systems: psychometric validation study. *Journal of Nursing scholarship*, 47 (4), 371-376.
- IndexMundi (2015). Puerto Rico: Expectativa de vida al nacer. Retrieved from [http://www.indexmundi.com/es/puerto\\_rico/expectativa\\_de\\_vida\\_al\\_nacer.html](http://www.indexmundi.com/es/puerto_rico/expectativa_de_vida_al_nacer.html)
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.
- Ley núm. 120 de Puerto Rico, 24 de mayo de 2004. *Ley para declarar el mes de la prevención, tratamiento y cuidado de la artritis*. Retrieved from <http://www.lexjuris.com/lexlex/Leyes2004/lexl2004120.htm>
- Loeser, R. F. (2010). Age-related changes in the musculoskeletal system and the development of osteoarthritis. *Clinics in Geriatric Medicine*, 26(3), 371-386. Retrieved from <http://doi.org/10.1016/j.cger.2010.03.002>
- Lopategui Corsino, E. (2013). Prescripción de ejercicio - delineamientos más recientes: American college of sports medicine (ACSM) - 2014. *Saludmed.com: ciencias del movimiento humano y de la salud*. Retrieved from <http://www.saludmed.com/rxejercicio/rxejercicio.html>
- Martínez, M. E. (2000). *Diagnóstico diferencial monoartritis y poliartritis*. Retrieved from [http://escuela.med.puc.cl/publ/reumatologia/apuntes/19\\_Diagnostico.html](http://escuela.med.puc.cl/publ/reumatologia/apuntes/19_Diagnostico.html)
- Massardo, L. (2009). *Artritis reumatoide. Apuntes de reumatología*. Retrieved from <http://escuela.med.puc.cl/publ/apuntesreumatologia/artritisreumatoidea.html>
- Mora, M., Araya, G., & Ozols, A. (2004). Perspectiva subjetiva de la calidad de vida del adulto mayor, diferencias ligadas al género y a la práctica de la actividad físico recreativa. *Revista MHSalud*®, 1 (1). Retrieved from, <http://www.redalyc.org/pdf/2370/237017928002.pdf>
- National institute of arthritis and musculoskeletal and skin diseases. (2013). *Handout on Health: Osteoarthritis*. Retrieved from [http://www.niams.nih.gov/Health\\_Info/Osteoarthritis/default.asp](http://www.niams.nih.gov/Health_Info/Osteoarthritis/default.asp)

- Oficina de la procuradora de las personas de edad. (2009). *US Bureau of the census, international data base. Avanzada*. Retrieved from <http://www2.pr.gov/agencias/oppte/Documents/Areaestadistica/Perfil2010.pdf>
- Polit, D. F. & Tatano, C. (2006). *Essentials of nursing research*. (6<sup>th</sup> Ed.). Lippincott Williams & Wilkins.
- Ray, C. (2014). *Causas de la osteoartritis y artritis de la columna vertebral*. Retrieved from <http://www.spine-health.com/espanol/artritis-y-osteoartritis/causas-de-la-osteoartritis-y-artritis-de-la-columna-vertebral>
- Ríos Reyes, A. (1999). *Osteoartrosis*. Retrieved from [http://www.oocities.org/amirhali/\\_private/osteoartrosis.htm](http://www.oocities.org/amirhali/_private/osteoartrosis.htm)
- Sève-Ferrieu, N. (2009). Independencia, autonomía y calidad de vida: Análisis y evaluaciones. *EMC - Kinesiterapia - Medicina Física*, 30 (1), 1–15.
- Walker, J. (2011). Management of osteoarthritis. *Nursing Older People*, 23 (9), 14-19. <http://dx.doi.org/10.7748/nop2011.11.23.9.14.c8778>
- Yildirim, N., Filiz Ulusoy, M. & Bodur, H. (2010). The effect of heat application on pain, stiffness, physical function and quality of life in patients with knee osteoarthritis. *Journal of Clinical Nursing*, 19, 1113–1120.



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