Adapting the Revised Prenatal Coping Inventory (NuPCI) for Use in a Spanish Population.

ABSTRACT

Objective: To adapt the Revised Prenatal Coping Inventory (NuPCI) for the evaluation of prenatal stress coping strategies utilised by Spanish women.

Methods: A cross-sectional study was performed to evaluate the psychometric properties of NuPCI adapted for a Spanish population. 261 puerperium women completed the NuPCI at the time of discharge after childbirth. Instrument construct validity was evaluated using subscale item correlations. Internal consistency was assessed using Cronbach's α test.

Results: Items from each subscale (Preparation, Avoidance and Spiritual – Positive Coping) were significantly correlated with the global result ($p<0.001$). The internal reliability of the NuPCI demonstrated suitable values for each of the three coping strategies ($\alpha > 0.7$). The most frequently used coping strategy was Preparation and the least used was Avoidance. Utilisation of the coping strategies with Preparation decreased with increasing parity ($p=0.002$) and greater prenatal stress was associated with increased use of the Avoidance coping strategy ($p<0.001$).

Conclusion: The NuPCI adapted for Spanish women demonstrates good psychometric properties for evaluating the three types of prenatal stress coping strategies: Preparation, Avoidance and Spiritual – Positive Coping. Results were similar to those presented by the instrument in its English language version.

INTRODUCTION

Maternity is a process that is characterised by physiological, social and emotional changes in the lives of the mother, her partner and her family. These changes begin with the pregnancy and usually result in a positive outcome. However, there is no doubt that the mother has to modify her self-identity, attitudes and interpersonal relationships [1,2].

Pregnancy is a very significant period in the life of many women; for some, it may be a time of crisis because it alters emotional stability and tests their ability to adapt to new demands [3]. Some authors have argued that pregnancy, birth and puerperium are distinct phases of gestation, separated by periods of transition. Each phase is finite and its duration is previously known. A period of transition is defined as a period of adjustment (between two stable periods) in which the mother experiences changes in her internal and external worlds [4]. Adaptation is understood as the psychological response to these changes. The responses and reactions and the way that people manage and tolerate the stress caused by transitions are known as coping strategies [5].

For Lazarus and Folkman [5], 'coping' refers to behavioural and cognitive efforts to overcome a stressful situation and its negative consequences. The process of coping begins when an individual feels threatened [5]. It is important to understand that the situation, in and of itself, is not the cause of an emotional reaction; the reaction depends on how an individual interprets the situation [6]. Although coping theory does not presume that any particular coping strategy is inherently adaptive or maladaptive, it can be said that adaptive coping results in a reduction of negative emotions and generates other favourable outcomes [7].

The manner in which women appraise events during pregnancy may shape their emotional and behavioural responses and influence their capacity to cope. There is evidence that the response to stress is individual and depends on women's life

experiences, personality, their understanding of the challenges of pregnancy, their history of medical interventions and their integration in the decision-making processes during pregnancy, birth and puerperium [3,8].

The existing literature demonstrates a relationship between maternal stress and adverse pregnancy outcomes including premature birth and low birth weight [9]. There is also evidence that the psychosocial conditions during pregnancy can have a lifelong effect on the cognition, emotions, health and behaviour of the child [10,11]. The effects of the stressful stimuli may be mitigated or even avoided by the use of coping mechanisms and strategies. Understanding how women cope with stress in pregnancy, especially with pregnancy-specific concerns such as impending labour and delivery, infant health, and parenting, is of paramount importance for health professionals [12].

A number of instruments have been developed for the evaluation of these 'coping strategies'; one of them is the Revised Prenatal Coping Inventory (NuPCI), which can be used throughout pregnancy. Other instruments such as the Stress Coping Questionnaire [13] have similar structural and methodological characteristics [14] but are not specific to pregnant women. Another advantage of the NuPCI is its simplicity; there are only three, clearly distinct subscales, as compared, for example, to the seven subscales of the Stress Coping Questionnaire.

The NuPCI is a revised version of the PCI [7,15,16], which was modified so it could be administered by interview. It was further revised to include open-ended questions and to take account of research on coping responses to pregnancy [4]. A three-factor structure was developed with three subscales that were conceptually interpretable and internally consistent:

1) Preparation: 15 items that focus on the birth. Preparation is associated with positive outcomes but it is not effective against adverse outcomes [7].

2) Avoidance: 11 items related to adaptation; there are situations such as the inability to actively control stressors, in which Avoidance provides emotional benefits [7].

3) Spiritual – Positive Coping: 6 items on the benefits of pregnancy. Prayer has been associated with reduced emotional suffering [7].

The instrument has been validated and applied in other studies [10,17,18]. In the most recent published work, a confirmatory factor analyses was conducted and repetitive items were eliminated [4].

Due to the absence of specific instruments to assess coping strategies for stress during pregnancy among Spanish women, the main aim of this research was to adapt the NuPCI for its application in Spain. A secondary objective was to study which are the most frequently used coping strategies in pregnant Spanish women and evaluate whether there were significant associations in Spanish women between the frequency of the application of coping strategies and age, the number of previous births (parity) and prenatal stress.

PARTICIPANTS AND METHODS

Design

A cross-sectional study was performed to evaluate the psychometric properties of the NuPCI and to study the coping strategies of pregnant Spanish women.

Sample and Data Collection

Data collection took place during two randomly selected periods of time, separated by a 5-month interval. Data was collected in September/October and April/May.

The sample comprised puerperal women who were at least 18 years of age. All subjects gave birth at the Obstetrics Unit of the Clinical University Hospital. Exclusion criteria were: not being of Spanish descent; a lack of signed informed consent; preterm delivery (< 37 weeks of pregnancy); having made a request for voluntary discharge; a maternal transfer to another hospital; severe postpartum maternal complications involving ICU admission; and, a diagnosed maternal psychiatric pathology.

The sample size was calculated for a 95% confidence interval with a margin of error no more than 2.0%, in accordance with the findings of the pilot study. This resulted in a sample size of 260 women.

Participants were recruited from the registration books of the delivery rooms. They were recruited consecutively, and completed the instrument on the day of discharge - 48 hours after vaginal delivery or 4 days after undergoing a caesarean section. The objectives and procedure of the study were explained to the participants by the midwife-researcher and they were provided with an information document and a workbook. Women were asked how often they used different kinds of coping to try to manage the strains and challenges of being pregnant in the past month. All participants gave signed, informed consent. Anonymity was guaranteed.

Variables and Instrument

Age and parity were registered and analysed as quantitative variables.

The adapted NuPCI was used to assess the way in which pregnant women cope with their situation. Participants reported how often they used each coping strategy on a scale

from 0 (never) to 4 (very often). They were also questioned on their perceptions of prenatal stress and then (following authors such as Hamilton and Lobel [4]) they were asked to subjectively self-evaluate their levels of stress; there were 3 categories: i) No stress; ii) Little stress; or iii) High stress.

Cultural Adaptation of the NuPCI for the Spanish Population

The NuPCI was chosen as it is specific to pregnant women. The instrument had previously been translated into Mexican Spanish and validated in that population by Lobel et al (data unpublished). In our research, for NuPCI application in Spanish woman, some changes in phraseology, vocabulary and verb tenses were required for the participants to clearly understand the questions. These changes were made by two obstetrics experts, who ensured that the original meanings were maintained. Two other individuals (who were not obstetrics experts) confirmed the comprehensibility of the instrument. A pilot study was then performed with 76 puerperal women from the Obstetrics Unit to assess understanding of the items.

The NuPCI can be easily self-administered. The aim of the instrument and the scale for each item were explained to participants before completion. The time required to answer the questions was estimated to be 15 minutes. Data were easily and rapidly coded to obtain the final scores. The author of the instrument gave permission to use and modify it.

Data Analysis

Relative and absolute frequencies were calculated for the qualitative variables, parity (first-time mothers, second-time mothers, multiparous) and stress (no stress, little stress,

high stress). Average and standard deviations (SD) were determined for the quantitative variables. The KMO (Kaiser, Meyer and Olkin) test was used to measure the psychometric properties of the NuPCI for prenatal coping strategies. Bartlett´s sphericity test was used to determine the strength of association among the items in each subscale. Correlations were calculated for each item and the relevant subscale to confirm correspondence of the items and their inclusion in the final instrument. The study was performed according to criteria of normality and the Spearman correlation coefficient. Finally, the internal consistency of the instrument was analysed to ascertain whether all of the items demonstrated suitable levels of correlation and defined a strong internal structure with sufficient homogeneity. The internal reliability of each subscale was tested with Cronbach's alpha as there were more than two response categories for each item. To compare averages between independent groups, the Kruskal-Wallis test or ANOVA was used according to the criteria of normality (Kolmogorov-Smirnov Test) in cases of more than two categories. The Pearson correlation coefficient or the Spearman correlation coefficient was used to demonstrate the correlation between two continuous variables according to the criteria of normality (Kolmogorov-Smirnov test). A confidence level of 95% was achieved, establishing a level of statistical significance for a p value of less than 0.05. The statistical program SPSS v15.0 was utilised throughout the study.

Ethical Considerations

The research project was approved by the Regional Ethics Committee of Aragon (Protocol No. C.I. PI11/0020) and the hospital. All participants were informed of the

purpose of the study. Eligible women were assured that data would be only by used for the study and that a decision to withdraw would not compromise their standard of care.

RESULTS

The high level of participation is worth noting; 96.22% of the postpartum women that were approached agreed to be involved in the project.

Basic demographics

Participants ranged in age from 20 to 43 years, with a mean age of 32.34 years (SD=4.33). Over half (52.5%) the sample were first-time mothers, 39.8% were expecting their second child and 7.7% were multiparous, with three or more children. All the women were interviewed without considering prior diseases or pregnancy complications. Low levels of prenatal stress were reported by 50.8% of women, just 5.8% reported high levels of stress.

The psychometric properties of the NuPCI adapted for Spanish women

The psychometric properties of the NuPCI were assessed with data obtained from the sample of 261 Spanish women. The response rate was 92.7% for the Preparation subscale, 93.5% for the Avoidance subscale and 95% for Spiritual – Positive Coping. In the three subscales, more than 90% of the data was valid.

The KMO statistical test and the Bartell test of sphericity revealed that results were adequate for the three subscales of the instrument: Preparation (KMO>0.85, Bartell $p<0.001$); Avoidance (KMO>0.76, Bartell $p<0.001$); and Spiritual – Positive Coping (KMO>0.78, Bartell $p<0.001$).

A correlation analysis using the Spearman coefficient was performed for each subscale and the corresponding items in that subscale. All items in the three subscales - Preparation (*Table 1*), Avoidance (*Table 2*) and Spiritual – Positive Coping (*Table 3*) - were related to the global results of the subscale in a statistically significant manner ($p<0.001$). Cronbach's alpha statistical test (*Table 4*) showed that the homogeneity of the current NuPCI items was acceptable.

These results are similar to those published by Hamilton and Lobel for the English version of the instrument which was validated in a North American population.

Strategies for Coping with Prenatal Stress

The most frequently used coping strategy was Preparation. The mean score for this subscale was 2.49 (SD=0.61). The least used was Avoidance, with a score of 0.96 (SD=0.56). Spiritual – Positive Coping had a mean score of 1.37 (SD=0.92). For a clearer understanding of these results they were classified according to frequency of use. More than 90% of participants used Preparation strategies for coping with pregnancy related stress 'sometimes' or 'very often'. In contrast, 24.2% of woman reported that they did not use Avoidance strategies and 57.4% 'hardly ever' used them. Results for Spiritual – Positive Coping strategies were inconsistent: 55.2% of participants stated that they never or 'hardly ever' used them; 42.6% said that they used them 'sometimes' or 'very often'.

Influence of Age and Parity on Stress and Methods of Coping

No statistically significant differences were found regarding coping strategies and age ($p>0.05$). There was a statistically significant relationship between parity and

Preparation ($p=0.002$). Preparation stress coping strategies were used less frequently by women who had more children. The analysis of frequency of use of coping strategies in relation to intensity revealed statistically significant differences for Avoidance ($p<0.001$): women who experienced high levels of stress during pregnancy used this strategy more often than those who experienced lower levels of stress.

DISCUSSION

The main goal of this study was to adapt the NuPCI for use with Spanish women. Our results show that the instrument has suitable psychometric properties and good internal homogeneity. A study in a North American population of fluent English speakers reached a similar conclusion [4]. The NuPCI is a valid instrument, it is easy to administer and provides information on the frequency of use of three important coping strategies (Preparation, Avoidance and Spiritual – Positive Coping) employed during pregnancy. The instrument is also coherent with the perspective of coping as a dynamic process, changing in response to situational and contextual demands [4].

The manner in which an expectant mother copes with her emotions and the physical changes caused by pregnancy will influence the possibility of a healthy transition for the mother, her partner and her family. This is a process that is closely related to the mother's ability to satisfactorily assume new identities [19].

It is relevant and important for health professionals to be cognisant of methods for coping with stress during maternity as this will help the family to assume their new roles satisfactorily [19]. An emotionally intelligent person is characterised by their ability to process and express emotions and use coping strategies appropriate to their affective state [20]. Some pregnant women react to stress with neurotic attitudes or avoidance

strategies and this can result in symptoms of depression, anxiety, and non-adaptive behaviour [16,21].

The most frequently used coping strategy was Preparation, a technique that is consistently used by women throughout their pregnancies [4]. Whilst this strategy is generally associated with positive outcomes, it can lead to increased distress in high-risk pregnancies and among expectant mothers that suffer health complications [15].

In our sample, Avoidance was the least common strategy employed for managing prenatal stress, a result that is consistent with findings of some previously published works [4,15]. It should be noted, however, that a recent study [22] reported a moderate frequency of use of Avoidance in women with low-risk pregnancies but this research utilised the Coping Stress Questionnaire and this may have affected the results. It is important underline the fact that in our study, participants were selected after giving birth so the outcomes of stress were already known. It may be the case that feelings of avoidance that were perceived during pregnancy were masked by psychological adaptation [23]. The assessment of the validity of this hypothesis requires a longitudinal approach, from the beginning of pregnancy through to the birth. Avoidance has been associated with greater prenatal stress and the appearance of pregnancy-specific distress [7,15].

Compared with other works [16,22,24], the women in our sample made less use of Spiritual – Positive Coping strategies. Peñacoba et al. (2013) reported that Spiritual – Positive Coping was the least-common coping strategy among women with low-risk pregnancies [22]. Nevertheless, women with high-risk pregnancies [16,24], have been shown to frequently engage in Spiritual – Positive Coping. The strategy appears to help pregnant women adapt to stressful life events and it is therefore used to control prenatal stress [4,15].

There is evidence that a religious coping strategy has both positive and negative effects on health [25]. For example, in women with high-risk pregnancies, religious belief was found to be a coping strategy that diminished psychological symptoms and had a positive impact [4]. Negative religious coping includes punishing religious reappraisal, spiritual discontent, self-directed religious coping and interpersonal religious discontent. It must be remembered that there are a variety of spiritual coping strategies [26]; in order to undertake an exhaustive evaluation of them, it would be necessary to understand and take into account the individual's conception of religion and/or spirituality.

We found that the strongest statistical association was between parity and Preparation. First-time mothers were more likely than multiparous mothers to employ a Preparation strategy. It is possible that the first-time mother may feel a greater need to obtain information and make plans, suggesting that they may be more concerned about the pregnancy. Obviously, women with several children have previous experience of pregnancy and this may well mitigate their feelings of psychological unease [4,15,27]. Having previously given birth has been linked to a reduced use of Avoidance techniques [22]. It has even been suggested that a miscarriage makes women use coping strategies in a positive way although women find pregnancy after loss stressful and a threat, and this appraisal remains across all pregnancy [28,29,30]. Women with a previous miscarriage scored higher on the use of Spiritual – Positive Coping [30] and Preparation Coping and made less use of Avoidance Coping [29]. The impact of having several children and less use of Avoidance strategies seems to reflect a conception of maternity as a process in which passive and some strategies for adaptation are excluded and this can encourage woman to employ more effective coping strategies during subsequent stressful events [27].

STUDY LIMITATIONS

The study was cross-sectional and causal relationships could not therefore be determined. In addition, we did not observe the evolution of coping strategies over time, as was the case with the work of Hamilton and Lobel (2008) [4]. However, the main goal was to validate the NuPCI, and this was achieved.

A longitudinal study, aimed at evaluating strategies utilised at different points in time (before, during and after pregnancy), is a recommended future research line. Furthermore, as other authors have indicated [22,31], situational circumstances should be analysed to assess their significance with regards to whether a coping strategy will be adaptive and produce a positive result. Coping strategies should also be examined to determine how they affect the overall health of women. Finally, as suggested by Morling et al. (2003) [2], stress-coping research should also consider the influence of cultural differences.

CONCLUSION

Due to the wide range of harmful effects that intense prenatal stress can have on the health of the mother and child, it is essential for health professionals to understand how pregnant woman cope with the difficulties that may arise. The adaptation of the NuPCI to a Spanish population facilitates its application among pregnant Spanish-speaking women, and this can increase our knowledge about the methods used to cope with stress in Spanish society. If we are aware of the levels of stress suffered by pregnant women and the coping strategies that they employ, we will better understand their experience of the transition to motherhood and be able to undertake a more profound analysis of health

perceptions during pregnancy and puerperium. This would enable us to develop specific interventions to meet personal needs.

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Declaration of interest

The authors declare no potential conflicts of interest with regards to the research, authorship and/or publication of this article.

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Current knowledge on the subject:

- Maternity is an important event that is characterised by physiological, social, and emotional changes in the lives of the mother, her partner, and her family. In response to these changes, pregnant women often experience states of elation and joy, mixed with feelings of anxiety and tension.

- The existing literature demonstrates a relationship between maternal stress and adverse pregnancy outcomes, including prematurity and low birth weight. There is evidence that psychosocial conditions during maternity have a lifelong effect on the cognition, emotions, health, and behaviours of the child.

- Whilst pregnancy may be the cause of considerable stress, the effects of the stressful stimuli may be mitigated or even avoided by the use of coping mechanisms and strategies.

What this study adds:

- The adaptation of the questionnaire to a Spanish-speaking population facilitates its application among Spanish-speaking women, thereby increasing current knowledge on maternal stress coping mechanisms in Spanish culture.

- It is the first valid instrument for the evaluation of the prenatal stress coping strategies used by Spanish women.

- The results of the psychometric properties were comparable with previous studies