ORIGINAL RESEARCH – QUANTITATIVE

Adaptation and psychometric testing of the Practice Environment Scale for use with midwives

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A B S T R A C T

Background: The Practice Environment Scale (PES) has been used extensively to measure the quality of the practice environment of nurses working in a variety of work settings, and has been linked with quality of care, nurse wellbeing, job dissatisfaction and burnout. Although developed for nurses, many of the aspects addressed by the PES are also relevant to the midwifery profession, and may provide a tool to better understand midwives' decision to leave the profession.
Aim: To adapt the PES for use with midwives and to assess its psychometric properties.
Methods: An online survey containing the adapted version of the PES was distributed to a sample of hospital-employed New Zealand midwives ($n = 600$). Exploratory factor analysis was conducted to identify subscales which were compared for midwives who had, versus had not considered, leaving the midwifery profession.
Findings: Four subscales were identified, showing good internal consistency reliability (*Quality of Management*, *Midwife–Doctor Relations, Resource Adequacy and Opportunities for Development*). The lowest mean score was recorded for *Resource Adequacy* ($M = 2.38$). All subscales of the adapted 20-item PES:Midwives were significant predictors of the decision to leave the profession ($p < .001$) with odds ratios above 2.0. The strongest predictor was *Quality of Management* (OR = 2.6).
Conclusion: The PES:Midwives was successfully adapted for use with midwives and provides a psychometrically sound tool for research to identify factors associated with the wellbeing, job satisfaction and risk of attrition amongst hospital employed midwives. The PES:Midwives also provides a means of comparing the practice environment across different models of care and employing organizations.
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1. Introduction

The Practice Environment Scale (PES) was developed by Lake in 2002[1] to provide a measure of nurses' perceptions of the environment in which they worked. The PES was created using items from an earlier nurse survey (Nursing Work Index[2]) which was conducted to identify the organizational characteristics of hospitals that were successful in attracting and retaining nurses. This research was undertaken in America in the 1980s during a period of critical staff shortages – a problem still facing many health care settings worldwide today.

The aim of the development of the PES was to create a concise measure for use in research exploring the association between the nursing practice environment and nurse and patient outcomes. Using items from original Nursing Work Index,[2] a detailed five stage process was adopted to assess the suitability of items from the original pool of 65 items. This included exploratory factor analyses to identify the underlying structure of the scale and to identify items for removal. In the final solution reported by Lake[1] 31 items were retained, representing five subscales (*Nurse Participation in Hospital Affairs; Nursing Foundations for Quality of Care; Nurse Manager Ability, Leadership, and Support of Nurses; Staffing and Resource Adequacy; Collegial Nurse–Physician Relations*). Each of the scales showed good psychometric properties, and the construct validity of the scale was supported by significantly higher scores recorded for nurses from hospitals expected to have

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better nurse practice environments. The five subscale structure was verified using a second sample of nurses from a different hospital, however the authors suggest that further research is needed with different hospital types across other geographical areas.[1]

Since its development the PES has attracted widespread international interest. A review by Warshawksy and Havens in 2011[3] identified 37 articles published on the PES. The scale has been used in a variety of countries (America, Canada, Australia, Iceland, Taiwan, and Israel) and has been translated into a number of different languages (Chinese, French, Icelandic). Additionally the PES has been used across a wide variety of inpatient and outpatient practice settings including surgical, cardiac, orthopedic, oncology, intensive care, dialysis, and psychiatric wards. Research using the PES has investigated its association with a variety of organizational characteristics (size, staffing ratios, location, teaching status) and its impact on outcomes such as quality of care, patient safety and patient satisfaction (see review by Warshawsky[3]). A growing number of studies have also explored the link between the aspects of the work environment measured by the PES and nurse wellbeing, burnout, job satisfaction and intention to resign. Significant negative associations have been identified between PES subscale scores and nurses' levels of burnout, job dissatisfaction and reported intention to leave their job or the nursing profession.[4–6]

Although the PES was developed for use with nurses, many of the issues driving the need for the development of the PES are also relevant to the midwifery profession. There is growing concern in many countries over the shortages of midwives, with many leaving the profession due to poor job satisfaction.[7–9] Workforce shortages have serious implications for the care of women during pregnancy and childbirth. Key research studies conducted in United Kingdom[8,9] and Australia[10] identified factors specific to the attrition and retention of midwives. Although these studies were conducted in different midwifery cultures they identified the same key indicators which included the availability of adequate resources, support from managers, and feelings of control and empowerment in their work. These are very similar factors to those aspects included in the PES subscales, making this a potentially useful tool for assessing the work environment of midwives. Consequently this may lead to a better understanding of the factors important to successful workforce planning and long term sustainability of the profession. It may also prove useful for identifying work-related issues associated with stress and burnout among midwives – an issue receiving growing attention in the literature.[11]

The aim of this study was to adapt the PES for use with midwives and to assess the psychometric properties of the revised scale using a sample of New Zealand midwives. The study also aimed to explore the association between scores on the PES subscales and midwives' intention to leave the profession.

2. Participants and method

2.1. Procedure

The data used in this analysis was extracted from a large cross-sectional study exploring the emotional wellbeing midwives undertaken in New Zealand (NZ) in 2013 (n = 1073). Active practicing members listed on the database of the New Zealand College of Midwives were invited to participate in the study. As NZ midwives have a range of employment opportunities (ie, self-employed, employed, with some working across both models) only those midwives who indicated that they were employed in a hospital setting were included in this study (n = 600). An email invitation, which included a link to an online questionnaire, was sent to members with up to date email addresses. The study was approved by the ethics committee of Auckland University of Technology. All potential participants were provided with a detailed description of the study and informed consent was inferred from the completion of the anonymous online survey.

2.2. Measures

Included in the online survey were a series of demographic and work related questions, and an adapted version of the Practice Environment Scale (PES).[1] The PES items included in this study were reviewed by a panel of midwives to identify items that would require modification for use with a sample of midwives. The item "use of nursing diagnoses' (item 31 in Lake[1]) was not considered appropriate for use with midwives and it was therefore removed from the scale. Changes were also made to other items: where the word "nurse" was used in a question this was replaced with "midwife"; the word "patient" was replaced with "client"; "Nurse manager" was replaced with "Midwifery Unit Manager", "Nursing Administrators" replaced with 'Midwife Managers"; and "Physicians" replaced with "Doctors". The final revised PES-Midwives scale used in this study consisted of 30 items with respondents asked to indicate their level of agreement (1 = strongly disagree, 4 = strongly agree) with a series of statements concerning the presence of particular organizational characteristics (e.g. "Praise and recognition for a job well done").

Additional demographic questions (gender, age, and years of experience as a midwife) were included in the survey. Respondents were also asked to indicate (yes/no) whether they had considered leaving the midwifery profession in the last 6 months.

2.3. Statistical analysis

Principal Components Analysis (PCA) was conducted using SPSS Version 21 to explore the underlying structure of the 30 PES-Midwives items. To assess the suitability of the dataset for PCA the Kaiser-Meyer-Olkin test of sampling adequacy[12] (values above .6), and Bartlett's Test of Sphericity[13] ($p < .001$) were conducted. Three decision rules were used to guide the selection of factors: Eigenvalues above 1, Catell's scree test,[14] and Parallel Analysis.[15] Parallel Analysis compares the eigenvalues from EFA with those obtained from a randomly generated datafile of the same size. Only factors with eigenvalues exceeding that obtained from the corresponding eigenvalue of the random data set were retained. Parallel analysis was conducted using the software developed by Watkins.[16]

The solution was rotated using Oblimin rotation to assist interpretation, with items being considered for removal from the scale if they failed to load above .4 on any factor, or if they showed substantial cross loadings on two or more factors. The final solution was also subjected to Principal Axis Factoring, as recommended by Pett et al.[17] to ensure that the interpretation was robust across extraction techniques.

Items from each of the components identified using PCA were added together and divided by the number of items to create subscale scores. Scores on each of the subscales could range from 1 (indicating low levels of the characteristic) to 4 (indicating high levels). Descriptive statistics were generated for each of the subscales. Cronbach alpha coefficients were computed to assess the internal consistency reliability of each of the subscales, with values of .7 considered acceptable.[18]

Scores on each of the PES:Midwives subscales were compared using independent samples t-tests for groups of midwives who indicated that they had considered, versus had not considered, leaving the midwifery profession in the last 6 months.

Consistent with the procedures used for the original PES,[1] subscale scores were collapsed into two categories (above and below 2.5). Scores below 2.5 represent ratings indicating