# The Development and Initial Validation of the Perinatal Mental Health Awareness Scale in Student Midwives

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| ARTICLE INFO | ABSTRACT |
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| *Article type:*<br>Original article<br><br>*Article History:*<br>Received: 14- Nov -2016<br>Accepted: 05- May -2017<br><br>*Key words:*<br>Assessment<br>Curriculum<br>Holistic<br>Learning disability<br>Perinatal mental health<br>Psychometric | ***Background & aim***: Perinatal mental health problems have been demonstrated to impact upon maternal, and fetal/child outcomes. Despite the global evidence and a policy-driven responsibility for identification of these problems, research demonstrates that student midwives/midwives lack knowledge and confidence to assess, identify, and manage them. A similar context is evident for learning disabilities, despite the holistic care philosophy of midwifery. A brief assessment tool to identify knowledge and confidence deficits and strengs within a holistic care framework could support curriculum development. This study sought to develop a Perinatal Mental Health Awareness scale and evaluate its psychometric properties in student midwives.<br>***Methods:*** We employed a cross-sectional and exploratory instrument development and evaluation design to determine the measurement veracity of the new scale.<br>***Results***: The scale demonstrated good psychometric properties, revealing three subscales mapping onto (i) mental health symptoms, (ii) physical/medical issues and (iii) learning disability. Results indicated a clear differentiation in scores across the subscales, indicating comparative deficits in mental health domains.<br>***Conclusion:*** Our findings facilitate confidence in the psychometric robustness of the measure. The scale enables student midwives to assess and compare different domains of midwifery practice, in line with a holistic model of midwifery care. A focus on physical health in midwifery education appears to disadvantage knowledge and confidence for managing mental health problems in a midwifery context. This valuable finding highlights the potential need for curriculum rebalancing. The measure offers the opportunity to assess and develop curriculum/training provision and monitor the effectiveness of subsequent curricular developments. |

## Introduction

Pregnancy, labor, and postnatal period are recognised as a period of physiological and psychological transition (1). The focus on physical health and well-being is related to the legacy of the risk discourse that continues to pervade maternity culture and practice, deriving from awareness of the possibility of adverse outcomes or maternal or neonatal mortality (2). Caring for physical well-being of mothers and their infants is key to midwifery practice and is embedded within midwifery curriculum. Currently, this concept is accompanied by a growing recognition and focus on a more holistic perspective; one which encompasses emotional, psychological, social, as well as physical needs (3), and quality maternity services should be able to provide care across all those domains. This need for a holistic approach has been reinforced by a growing body of literature in which perinatal mental health problems (PMHP) are now widely acknowledged to affect women globally and from across the population. In high-income countries, 10% of pregnant women and 13% of mothers of infants suffer from significant mental health problems, depression and anxiety being the most common, with rates much higher in low- and

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middle-income countries (4).

PMHP are demonstrated to have a significant impact on women's well-being, long-term mental health, obstetric outcomes, partner, and quality of family relationships. It might also affect fetal health and child development in the short and long term (5). Depression has been identifed as the most common complication of maternity, which is twice as common as hypertension and postpartum haemorrhage and more than three times more prevalent than pre-eclampsia (6). Confidential enquiry reports in the UK, have continued to evidence psychiatric disorders as a significant cause of mortality in both pregnant and postnatal women (7-9). The burden of PMI in individual, societal, and economic terms has now been evidenced and must not be underestimated.

PMH is a potentially preventable cause of perinatal mortality, with treatment options available (10). Guidelines in England, Scotland, Australia, and Canada (11) give midwives a clearly defined role for the assessment and identification of PMHP to underpin appropriate and proactive referral and care decisions, which assure the necessary support that women and their families require. Childbirth provides a clear opportunity for professionals who come into contact with women to make a positive impact on adverse obstetric and mental health outcomes related to PMHP(12) and midwives do accept PMH care as part of their role (13). This, however, requires awareness and understanding of common mental health problems, as well as the confidence to make enquiries of women about their mental health status. This is an area that contniues to be identified as problematic for midwives (13-16), and more recently, student midwives (17-19), suggesting that training and education is not preparing practioners to effectively address this element of care provision. Similar findings, are being demonstrated in a small but contemporary body of literature on midwives' experiences of caring for women with learning disabilities (LD) (20, 21), resulting in these women receiving sub-optimal care within maternity services and potentially less favourable outcomes.

An accruing body of evidence demonstrates defects in midwives' knowledge, skills and confidence with regard to PMHP and LD.

Training interventions in PMH have been shown to be effective in improving knowledge and confidence across international settings (13, 22, 23). Educational packages in undergraduate midwifery education have also been demonstrated to be effective in enhancing knowledge, skills and attitudes towards women with PMHP (19). Educational and continuing professional development (CPD) opportunities, which are academically robust and professionally relevant, should be available to all midwives and maternity professionals. A clear case for this exists in relation to PMH.

Contemporary curricula have the ability to drive practice (3, 24) and in terms of national knowledge and skills deficits provide a good starting point for a holistic approach. That student midwives feel ill-prepared in relation to identifying and managing PMHP (25) and that PMH is given little attention within the midwifery curriculum (18) is concerning. Thus, midwifery educationallists may need to consider the relvance of that within their own curricula and question how knowledge, skill and confidence for PMH and LD are supported (or not) in the practice environment.

Training in maternity units continues to be dominated by a focus on obstetric issues, risk management and emergencies. Yet, to enhance the quality of maternity care, training should be focused on local needs (26), that however, is premised on knowing what that local need is. A brief assessment tool that enables educationalists and service providers to explicitly identify those domains of practice where student midwives, midwives and other maternity professionals experience skills knowledge and confidence deficit could facilitate the development of focused education and training interventions. It could also provide a tool to undertake post-training evaluation as well as snapshot monitoring of training needs.

The present study sought to develop and evaluate key psychometric attributes including the factor structure, validity and reliability of a Perinatal Mental Health Awareness (PMHA) scale. Specifically relating these aspects of measurement veracity to research questions:

(1) Does the PMHA scale comprise three correlated sub-scales of (i) mental health, (ii) physical health and (iii) learning disability

awareness?

(2) Do the PMHA total measure and identified sub-scales demonstrate adequate internal consistency?

(3) Do the PMHA total measure and identified sub-scales demonstrate adequate divergent reliability?

(4) Do the PMHA total measure and identified sub-scales demonstrate adequate convergent reliability?

(5) Do the PMHA total measure and identified sub-scales demonstrate acceptable known-groups discriminant validity?

(6) Do the identified PMHA sub-scales demonstrate sub-scale discriminability?

## Materials and Methods
### Design and participants
This cross-sectional study with an exploratory instrument development design was performed to determine the measurement veracity of the PMHA scale. A standard battery of validity and reliability statistical tests were used to evaluate the PMHA consistent with contemporary approaches in this area (27, 28).

### Participants
Ten universities across the UK currently involved in the training of student midwives took part in the study. Students in the final year of a BSc Midwifery programme, either undertaking a 3-year or 18-month programme, were asked to complete an online questionnaire, delivered via SurveyMonkey, focused on issues related to PMH. Students near completion of their midwifery programme were chosen as it was anticipated they would have received significant theoretical curricula content and exposure to a range of issues within practice across the domains of physical and psychological health.

Students were given a presentation about the study by a midwifery lecturer from their institution at least a week prior to access to the questionnaire being opened, with the opportunity to ask questions or seek clarification. An email invitation was then sent from the host institution containing link to PIS and link to SurveyMonkey questionnaire. One email reminder was sent to students via the administrator working at the student's university faculty. The preference was to allow protected time for students to complete the questionnaire, the response rates increased when this was facilitated, though students could also complete independently.

Ethics approval was obtained from the university ethics committees at all study sites. Consent was embedded at the beginning of the online questionnaire and 266 questionnaires were fully completed.

### Measures
### Perinatal Mental Health Awareness (PMHA) scale
The PMHA scale items were developed by an expert panel for initial use in a study exploring knowledge and confidence of health visitors about PMH (23). Its purpose was to represent, with brevity, key attributes of awareness related to perinatal mental health issues. The key attributes ascribed were (i) knowledge, (ii) confidence in identification and (iii) confidence in the management of more common PMH presentations such as stress, anxiety and depression (SAD), with one question per attribute scored on a 0-3 Likert scale, where a greater score endorsement indicated greater awareness.

For the purpose of this study, the scale was extended to address knowledge and confidence across other aspects of care provision relevant to the practice of midwives. The same format and question stems were used to ask about learning difficulty (LD) and physical/medical issues (MED); thus, the PMHA scale comprises of three sub-scale domains (perinatal mental health, learning difficulty and physical/medical issues) each comprising of three questions (Figure 1). Inclusion of a physical/medical sub-scale was designed to purposively allow comparisons with mental health and learning difficulty awareness. The adapted scale, as part of a larger project, was piloted with a group of 15 student midwives not included in the main study, who provided feedback on design, clarity, content and format.

### Multi-dimensional Health Locus of Control (MHLC) Scale
Locus of control was assessed by an adapted version of Form C of the Multi-dimensional Health Locus of Control (MHLC) scale developed

**Figure 1.** PMHA scale and subscales

**PMHA SAD**

Question 1: How knowledgeable you are about the following conditions:

| Stress, Anxiety and Depression | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

| Learning Disabilities | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

| Medical, obstetric conditions e.g. pre-eclampsia, HIV, Symphysis Pubis Dysfunction | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

**PMHA: LD**

Question 2: How confident are you in identifying the following conditions:

| Stress, Anxiety and Depression | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

| Learning Disabilities | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

| Medical, obstetric conditions e.g. pre-eclampsia, HIV, Symphysis Pubis Dysfunction | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

**PMHA: MED**

Question 3: How confident are you in managing the following conditions:

| Stress, Anxiety and Depression | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

| Learning Disabilities | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

| Medical, obstetric conditions e.g. pre-eclampsia, HIV, Symphysis Pubis Dysfunction | | | |
|---|---|---|---|
| Very knowledgeable | Knowledgeable | Not very knowledgeable | Not knowledgeable |
| ⓞ | ⓞ | ⓞ | ⓞ |

by Wallston and colleagues (29). The MHLC scale contains four domains of locus of control (LC), these being internal (6-items), chance (6-items), doctors (3-items) and other people (3-items), which represent beliefs about control over health. The MHLC was modified for numerous disease states and previously for the perinatal context (30) and found to be relevant to health behaviours. In this study, modifications to the measure were to focus the questions on the perinatal period and mental health and wellbeing, to explore practitioners' views of women's LOC in a PMH context across the four domains. The format was also modified to a four-point Likert format on a 0-3 rating for each of the 18 items. Higher scores indicate greater levels of belief in the particular LC attribute.

### Professional Issues (PI) scale

The Professional Issues (PI) scale is a perinatal mental health-specific survey measure adapted from a survey devised by Elliott and colleagues (31) to assess the perception of professional issues associated with the provision of perinatal mental health care. For the purposes of this study, it was scored on a four-point Likert scale (0-3); the PI scale is scored in the current study so that higher scores

indicate greater agreement with professional aspects of care delivery that would positively influence the provision of appropriate care and support.

### Perinatal Mental Health Equity (PMHE) screen

A single item designed to assess perceived equity between mental health and physical/ medical health provision was used to categorise participants to two groups, those who perceive equity between the domains and those who do not. The question was constructed to reduce response-bias by specifically not asking about equity. A three-choice, forced-response format was used and the question asked how participants felt about asking women about mental health. The response 'fine, it is the same as any other question' was interpreted as indicative of equity.

The 4-point rating approach used in the multi-item scales was taken to address congeric and tau-centric concerns of questionnaire measures where it has been noted that inconsistent response formats may deleteriously affect the rigour with which comparisons between measures may be made (32).

### Statistical analysis
### Exploratory factor analysis

Exploratory factor analysis (EFA) was used to determine the factor structure of the PMHA scale. The suitability of a maximum-likelihoods estimation approach to EFA is contingent on the distributional characteristics of the dataset and the elimination of multivariate outliers. Kline (33) suggests that skew values > 3 and kurtosis >10 are indicative of non-normality of the data. Multivariate outliers were detected by the calculation of the Mahalanobis distances (34, 35) for each participant and measure used in the study. Parallel analysis (36) was to determine the optimum number of underlying factors as a specification for the EFA. An oblimin factor rotation procedure was used since it was assumed that the underlying factors would be correlated (37, 38). A significant item-factor loading was determined by a coefficient level of >0.40. Multiple goodness of fit tests (39) were used to evaluate the model that emerged from the EFA, including the comparative fit index (CFI) (40),

the Root Mean Squared Error of Approximation (RMSEA) and the standardised root mean square residual (SRMR). A CFI value greater than 0.90 indicate an acceptable data fit (41) and CFI values of 0.95 and above demonstrate good model fit (42). RMSEA values of less than 0.05 indicate a good fit to the data (43). SRMR values of less than 0.08 indicate acceptable model fit (42), while SRMR values of 0.05 or less are indicative of good model fit (44).

### Divergent validity

Divergent validity was determined by correlating PMHA total and sub-scale scored with the MHLC 'doctors' sub-scale score. It was predicted that there would be no statistically significant relationship between PMHA measures and the MHLC 'doctors' sub-scale score.

### Convergent validity

Convergent validity was evaluated by correlating PMHA total and sub-scale scores with the PI scale. It is predicted that there would be a significant positive correlation between PMHA total and sub-scale scores and the PI total score.

### Known-groups discriminant validity

Known-groups discriminant validity was evaluated by comparing those categorised as perceiving perinatal mental health issues as equitable to physical health issues to those who did not use the PMHE screening question using the between-subject *t*-test. It was predicted that those who perceived perinatal mental health issues as equitable to physical health concerns would have significantly higher scores on PMHA sub-scales.

### Sub-scale discriminability

The discriminability of the PMHA sub-scales was evaluated using repeated-measures analysis of variance (ANOVA). It is predicted that the PMHA-MED sub-scale score would be significantly higher than the PMHA-SAD sub-scale score and the PMHA-LD sub-scale score.

### Internal consistency

PMHA-SAD, PMHA-MED and PMHA-LD sub-scales and the PMHA total score were evaluated for internal consistency characteristics using

Cronbach's alpha coefficient. A Cronbach's alpha of 0.70 or greater is indicative of acceptable internal reliability (27).

Statistical analysis was conducted using the statistical software package R (R core team, 2013).

## Results

A total of 266 participants took part in the study, the majority being from direct entry programme (N=237) and the remainder from the shortened 18-month programme for qualified adult nurses (N=29). The smallest number recruited from a single site was 14 and the largest 44. The majority of participants (N=191) were aged 30 or younger. All the participants were female. Evaluation of Mahalanobis distances revealed the presence of 18 multivariate outliers in the dataset and these participants were consequently excluded from further analysis (final dataset N=248, direct entry N =221 [89%], conversion course N=27 [11%]). The mean, standard deviation, skew and kurtosis of each PMHA item are shown in Table 1. Skew and kurtosis characteristics for each item indicate a univariate normal distribution (skew <3, kurtosis <10).

### Exploratory factor analysis

The Kaiser-Meyer-Olkin measure of sampling adequacy (0.73) and the Bartlett test of sphericity ($\chi^2$=700.93, df=36, P<0.001) indicated suitability for EFA. Parallel analysis indicated three factors, confirmed by examination of very simple structure (VSS), which revealed a complexity of 0.84 with three factors. Three factors with Eigenvalues greater than 1. (3.34, 1.67 & 1.07) accounted for 53% of the cumulative variance explained by appraisal of sums of squared (SS) loadings. Factor 1

comprised of items specifically related to learning disability (PMHA-LD), Factor 2 included items exclusively related to physical and medical aspects of care (PMHA-MED), whereas Factor 3 comprised of items related to stress, anxiety and depression (PMHA-SAD). The item-factor loadings are summarised in Table 2. The fit to data of the three-factor model was overall acceptable ($\chi^2_{(df=12)}$=36.77, P<0.01, CFI=0.96, RMSEA=0.09 (0.06-0.13, 95% CI), RMSR=0.03, df-corrected RMSR=0.05). Correlations between the extracted factors were all statistically significant (P<0.001).

### Divergent validity

No significant correlation was observed between the MHLC 'doctors' sub-scale score and PMHA-LD (r=0.01, P=0.90), PMHA-MED (r=-0.02, P=0.80) and PMHA-SAD (r=-0.02, P=0.70) sub-scale scores. No significant correlations were observed between the MHLC 'doctors' sub-scale score and the PMHA total score (r=-0.01, P=0.90). The data characteristics of all MHLC sub-scales, including the 'doctors' sub-scale, are summarised in Table 3.

### Convergent validity

Significant positive correlations were observed between all the PMHA sub-scale scores and the professional issues total score (PMHA-LD, r<0.30, P<0.001; PMHA-MED, r=0.29, P<0.001, PMHA-SAD, r=0.40, P<0.001). The PMHA total score was also significantly correlated with the professional issues total scale score (r=0.44, P<0.001).

### Known-groups discriminant validity

The Perinatal Mental Health Equity (PMHE) measure revealed that 151 (61%) participants endorsed the equity response. Independent

**Table 1.** Individual item distributional characteristics of the Perinatal Mental Health Awareness (PMHA) scale and associated content domains (N=248)

| PMHA item | PMHA item content | Domain | Mean | SD | Skew | Kurtosis |
|---|---|---|---|---|---|---|
| PMHA 1 | Stress, anxiety and depression | Knowledge | 1.91 | 0.52 | -0.27 | 4.03 |
| PMHA 2 | Medical and obstetric conditions | Knowledge | 2.16 | 0.50 | 0.30 | 3.42 |
| PMHA 3 | Learning disabilities | Knowledge | 1.48 | 0.65 | 0.13 | 2.78 |
| PMHA 4 | Stress, anxiety and depression | Identification | 1.90 | 0.53 | -0.09 | 3.36 |
| PMHA 5 | Medical and obstetric conditions | Identification | 2.18 | 0.55 | 0.05 | 2.90 |
| PMHA 6 | Learning disabilities | Identification | 1.61 | 0.65 | -0.20 | 2.90 |
| PMHA 7 | Stress, anxiety and depression | Management | 1.54 | 0.58 | 0.32 | 2.26 |
| PMHA 8 | Medical and obstetric conditions | Management | 1.87 | 0.56 | -0.23 | 3.78 |
| PMHA 9 | Learning disabilities | Management | 1.26 | 0.66 | 0.17 | 3.00 |

**Table 2.** Factor loadings of the Perinatal Mental Health Awareness (PMHA) sale following exploratory factor analysis with maximum-likelihood factor extraction and oblimin rotation (N=248)

| PMHA item | PMHA item content | Domain | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|---|---|
| PMHA 1 | Stress, anxiety and depression | Knowledge | 0.07 | -0.06 | 0.52 |
| PMHA 2 | Medical and obstetric conditions | Knowledge | -0.03 | 0.69 | -0.02 |
| PMHA 3 | Learning disabilities | Knowledge | 0.70 | 0.01 | 0.10 |
| PMHA 4 | Stress, anxiety and depression | Identification | -0.03 | 0.06 | 0.78 |
| PMHA 5 | Medical and obstetric conditions | Identification | -0.10 | 0.82 | 0.10 |
| PMHA 6 | Learning disabilities | Identification | 0.46 | 0.09 | 0.28 |
| PMHA 7 | Stress, anxiety and depression | Management | 0.26 | -0.04 | 0.50 |
| PMHA 8 | Medical and obstetric conditions | Management | 0.24 | 0.67 | -0.11 |
| PMHA 9 | Learning disabilities | Management | 0.90 | 0.01 | -0.03 |

**Table 3.** Multidimensional Health Locus of Control (MHLC) sub-scale scores, Professional Issues (PI) total scale score and associated distributional characteristics

| Scale | Sub-scale | Mean | SD | Skew | Kurtosis |
|---|---|---|---|---|---|
| MHLC | Internal | 4.74 | 2.07 | 0.27 | 3.34 |
| MHLC | Chance | 4.17 | 2.41 | 0.01 | 2.49 |
| MHLC | Doctors | 4.90 | 1.10 | 0.01 | 3.89 |
| MHLC | Other people | 5.79 | 1.46 | -0.30 | 4.05 |
| PI | Not applicable | 17.99 | 3.90 | 0.35 | 3.25 |

**Table 4.** Mean perinatal mental health awareness total and sub-scale scores as a function of perceived equity of perinatal mental health to physical health (N=248); standard deviations are in parentheses

| Variable | Equity (N=151) | Non-equity (N=97) | t | df | P | Cohen's d | d 95% CI | Effect size |
|---|---|---|---|---|---|---|---|---|
| PMHA-SAD | 5.57 (1.26) | 5.00 (1.22) | 3.53 | 246 | <0.001 | 0.46 | 0.20-0.72 | small |
| PMHA-MED | 6.34 (1.35) | 5.99 (1.29) | 2.05 | 246 | 0.04 | 0.27 | 0.01-0.53 | small |
| PMHA-LD | 4.55 (1.63) | 4.03 (1.56) | 2.48 | 246 | 0.01 | 0.32 | 0.06-0.58 | small |
| PMHA-Total | 16.46 (3.06) | 15.02 (3.14) | 3.59 | 246 | <0.001 | 0.47 | 0.21-0.73 | small |

*t*-test reflected statistically significant differences between the groups defined by equity status on all the PMHA sub-scales and the PMHA total scale score, with mean scores being higher in the equity group. Cohen's *d* revealed effect sizes to be small for all PMHA comparisons between the groups. A summary -of between-groups data characteristics, -analyses and effect size estimations are shown in Table 4.

### *Sub-scale discriminability*

One-way repeated-measures ANOVA revealed a statistically significant effect of sub-scale category, $F_{(2, 494)}$=159.52, P<0.001, n²=0.22. Post-hoc Bonferroni-adjusted pairwise-comparisons revealed the PMHA-MED sub-scale score (M=6.21, SD=1.33) to be significantly higher (P<0.001) than the PMHA-SAD sub-scale score (M=5.35, SD=1.27) and significantly higher (P<0.001) than the PMHA-LD sub-scale score (M=4.35, SD=1.62). The PMHA-SAD sub-scale score was also observed to be significantly

higher (P<0.001) than the PMHA-LD sub-scale score. Figure 2 summaries the mean PMHA sub-scale scores and associated 95% confidence intervals.

### *Internal consistency*

The calculated Cronbach's alpha coefficients of the PMHA total scale, PMHA-SAD, PMHA-MED and PMHA-LD sub-scales were 0.79 (75-83), 0.68 (61-75), 0.77 (72-82) and 0.78 (74-83), respectively (95% confidence intervals in parentheses).

## Discussion

The goal of the current investigation was to develop a brief, easily administered, rapidly scored, valid and reliable measure of awareness of perinatal mental health issues specific to midwifery practice. Three sub-scales mapping onto the more common mental health symptoms associated during the perinatal period (PMHA-SAD), physical and medical issues (PMHA-MED) and learning disability (PMHA-LD) were
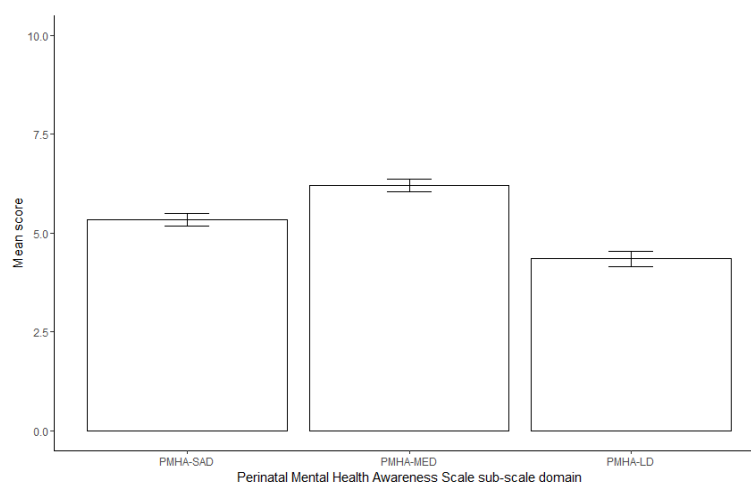
**Figure 2.** PMHA-SAD, PMHA-MED and PMHA-LD sub-scale mean scores; error bars represent 95% confidence intervals

evaluated and the performance of each sub-scale and the overall PMHA total score were found to be generally good to excellent on the majority of validity and reliability statistical tests. The scale items were clearly and unambiguously differentiated onto their respective domains of (i) mental health, (ii) physical health and (iii) learning disability.

Internal consistency of the instrument was also excellent for all the scales with the sole exception of the PMHA-SAD sub-scale, which was marginal (0.68). Though this fails to meet Kline's (27) criteria of 0.7, the threshold defined for determining good instrument reliability. Given that this subscale consisted of three items, an issue known to deflate Cronbach's alpha values (45), a marginal alpha should be considered acceptable given the purpose of the tool as a brief awareness screening instrument.

The findings from the convergent, divergent and known-groups discriminant validity analysis also suggest initial confidence in the psychometric robustness of this new tool. A unique feature of this new measure is an additional utility in the manner in which different domains (mental health, physical/medical and learning disability) may be compared within the same measure and the same respondents. To our knowledge, this is the first brief assessment tool to do so, yet such an approach is entirely consistent with a focus on mental health/physical health parity and national and international policy drivers,

guidelines and educational curricula to promote woman-centred care (3, 24, 26, 46). Support for the efficiency that this is achieved within the PMHA is provided by the evaluation of PMHA sub-scale discriminability, which demonstrates clear differentiation between total mean scores across the three sub-scales. This observation seems to reinforce the supposition that current curriculum provision within pre-registration midwifery programmes, which focuses more intensively on physical/medical aspects of care, potentially does so at the detriment of mental health aspects of care and learning disability. These findings highlight the desirability to achieve a balance in the respective domains assessed by the PMHA that could usefully inform curriculum content and present an opportunity to synchronise training more effectively with contemporary policy and guidance (5, 47, 48)**.** Validated findings as provided by the PMHA within this area are also particularly useful in challenging bias inherent in current training provision while also providing affirmative or corrective evidence for programmes that consider they have achieved 'balance'.

It should be noted that the scope of the PMHA in terms of development and initial validation has been circumscribed by the midwifery context. However, the individual items that comprise the PMHA are not midwifery-specific, they represent domains relevant to perinatal mental health more generally. It is thus suggested that further work

on the use and development of the PMHA could explore the utility of the measure in other groups of practitioners who come into contact with women during the perinatal period, such as nurses, health visitors, obstetricians, gynaecologists and general practitioners. Of value when evidence suggests that the knowledge and confidence issues experienced by midwives and student midwives is not unique but extends to health visitors (22, 23), general practitioners (49) (Centre for Mental Health, 2015), and health professionals generally (50). The value of such future work would be not only consolidate development work on the measure, but also facilitate useful comparisons between groups in order to determine relevant training and continuing professional development needs and evaluate the impact of training in the area of perinatal mental health. This approach would certainly be consistent with previous work of one of the authors of this paper (23) and the work of Higgins and colleagues (19) in the Republic of Ireland, which used pre-post test design to evaluate an educational module on perinatal mental health.

An important tenet to the development of the PMHA was the elimination of hubris with a central desire to focus specifically and without ambiguity on specific elements of knowledge, identification and management in relation to perinatal mental health issues. Learning disability represents a highly neglected area within the realm of perinatal mental health evidence and practice. The utility of the PMHA is to enable a comparison of this area with respect to perinatal mental health issues more generally and physical/medical issues associated with the perinatal period with which midwives may be more familiar. Similarly, given the parity agenda between mental health and physical health and the prima face focus of providing holistic woman-centred care, the inclusion of a physical/medical sub-scale within the PMHA allows a direct comparison between physical/medical and mental health domains to determine if the holistic ideal is being realised in education and practice.

The study had a small number of limitations, which are readily addressed through future development work on the measure. The survey design approach taken to data capture, while appropriate for initial development of the tool, does not allow the opportunity to evaluate test-retest reliability, a valuable additional index of psychometric integrity. The authors are currently planning a study specifically to evaluate the test-retest reliability of the PMHA sub-scales using a 12-week pre-post repeated-measures design consistent with the recom-mendations of Kline (27). Evaluating the sensitivity of the PMHA sub-scales to intervention is also a further recommendation to determine this performance attribute of the measure.

## Conclusion

The PMHA appears to provide a sound psychometric instrument for assessing student midwives' knowledge and confidence in identifying and managing PMH, LD and physical health in a maternity context. It offers the opportunity to robustly assess practitioners across the domains of practice that are inherent in a holistic approach to care and high quality service provision. The PMHA could support maternity services in a proactive approach to understanding training needs and developing training plans and internvetions that address the needs of women locally to ensure appropriate care is delivered to support and deliver the best outcomes for mother, child and wider family.

Whether this be at a student, generic or specialist practitoner level, education and training providers for midwives should ensure that the curricula are designed and developed to meet the skills, knowledge and confidence deficits (RCM, 2015). Use of the PMHA could support a review of the current status of undergraduate and postgraduate student knowledge as well as midwifery workforce to enhance a holistic model of maternity care provision, which effectively supports practitoners to balance care provision for psychological, social and physical needs.

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## Conflicts of Interest

All the authors declare no conflicts of interest.

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