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Evaluating psychometric properties of three mentoring scales among nurses and midwives in hospital settings: A methodological study

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Abstract

Background: Scales used to evaluate nurses' perspectives of mentoring programmes are mainly designed in developed countries, making them unsuitable for nurses and midwives working in resource-poor developing countries.

Aim: To explore the psychometric properties of the perceived cost of mentoring (PCM) scale, negative mentoring experiences (NME) scale and relational mentoring index (RMI) for adaptation in hospital settings in Uganda.

Methods: A cross-sectional study design was used. In total, 303 hospital nurses/midwives in Ugandan participated in the study to evaluate the psychometric properties of the three mentoring scales.

Results: Revisions based on word choice were made in adapting the scales to the Ugandan context. The PCM showed three factors (risk to reputation, mentoring effort and nepotism) and had an intra-class correlation (ICC) of 0.609 (95% CI, 0.324–0.793) and Cronbach's alpha of 0.705. The NME scale had two factors (lack of mentor expertise and mismatch between the dyad) consistent with the original scale with an ICC of 0.568 (95% CI, 0.271–0.767) and Cronbach's alpha of 0.841. The RMI showed two factors (individual influence and relational quality) with an ICC of 0.664 (95% CI, 0.410–0.824) and Cronbach's alpha of 0.933.

Conclusions: The initial psychometric assessment indicates satisfactory validity and reliability of the scales for implementation among nurses and midwives within Ugandan hospital contexts. Subsequent research is warranted to validate the factor structures of the scales on a different sample.

Implications for nursing and health policy: In using mentoring programmes to develop the hospital workforce, nurse and midwifery policymakers need to use culturally adapted and validated PCM, NME, and RMI scales to evaluate the quality of these mentoring programmes to maximise the benefits while avoiding unintended consequences.

KEYWORDS
Mentoring scales, negative mentoring, nursing, quality of mentoring

INTRODUCTION

Mentoring programmes have been widely used to engage experienced nurses and midwives in sharing clinical expertise with less experienced clinicians in acute care settings and have demonstrated benefits for patients, nurses/midwives and the hospital (Kakyo et al., 2021). For patients, mentoring leads to a better quality of care (Kramer et al., 2021); for nurses/midwives, mentoring offers the opportunity to enhance their clinical competence and advance their careers (Giacumo et al., 2020). The hospital benefits from using mentoring for recruitment and retention and demonstrating a commitment to the nursing/midwifery workforce's development (Bradford et al., 2022). Both the International Council of Nurses (ICN) and the Uganda Nurses and Midwives Council (UNMC) emphasise the role of mentoring relationships and programmes in demonstrating support for novices and promoting the continuity of the profession (International Council of Nurses, 2021; Uganda Nurses & Midwives Council, 2000). Mentoring programmes are particularly needed for nurses and midwives working in resource-poor countries, where continuing education and staff development opportunities are scarce. However, the instruments used to measure nurses' perspectives of these benefits and experiences in the programmes are mainly designed in developed countries, where the healthcare systems and the nursing/midwifery workforce significantly differ from those in the African region.

There is a critical shortage of hospital nurses and midwives in the African region, including Uganda. For example, the nurse-to-patient ratio in Uganda is 0.648 per 1,000, compared with 13.2 per 1,000 in Australia (The National Health Workforce Accounts database, 2022; World Health Organisation, 2017). In such a work environment with scarce resources, nurses/midwives are struggling to prioritise care activities, and their perspectives on the benefits of mentoring may differ from those in developed countries. Therefore, adapting the scales used to measure hospital nurses' perspectives of mentoring programmes in the African region is imperative in developing and evaluating mentoring programmes. This paper reports on the adaptation of three mentoring scales—the perceived cost of mentoring (PCM) scale, negative mentoring experiences (NME) scale and relational mentoring index (RMI) scale—in Uganda, with this country serving as an example of the African region.

Background

Mentoring as a strategy for professional development involves the interaction of the mentees, mentors and the organisation in a reciprocal manner to help new graduate or less experienced nurses adapt to clinical practice, socialise with their colleagues and advance their careers. To optimise mentoring benefits, organisations often set up mentoring programmes with prescribed responsibilities for the mentor and mentee

(Jakubik et al., 2017). The organisation-sponsored mentoring programmes are usually evaluated based on traditional mentoring principles that include career development, psychosocial support and role modelling functions (Jacobs, 2018). Recent studies show that the effectiveness of mentoring is based on the quality of the relationship between the mentee and the mentor (Venktaramana et al., 2023; Zhang et al., 2016), strongly suggesting the need to evaluate the relational aspects of the mentoring programme. Although the experiences of mentees and mentors in mentoring programmes are predominantly positive, negative relationships were also identified, for example, a sense of sabotage, jealousy, exploitative individuals and an unrewarding experience (Huang & Weng, 2017). In addition, mentors might perceive mentoring as a waste of their valuable time (Lee et al., 2019) while the mentee might feel the mentors lack the necessary competencies to mentor (Cheong et al., 2020). Therefore, policies relating to mentoring activities in the nursing and midwifery workforce development in hospital settings need to incorporate detailed measures to ensure the quality of and positive experiences in mentoring relationships. Such a policy approach to governing mentoring activities will also align mentoring outcomes with the hospital's vision on staff retention, career and professional development. Furthermore, using validated instruments to measure the positive and negative experiences of mentees and mentors is a condition for the organisation to monitor mentoring programme for the benefit of the mentees, mentors and the organisations.

The RMI scale measures positive relational functions between the mentee–mentor dyadic members in mentoring programmes. Relational functions influence the quality of mentoring. Ragins and Verbos (2017) argue that, in addition to the two traditional functions of mentoring—that is, career development and psychosocial support—high-quality mentoring offers relational functions. These functions are classified into six broad mentoring behaviours: 'personal learning and growth, inspiration, self-affirmation, reliance on communal norms, shared influence and respect, and trust and commitment' (Ragins, 2012, pp. 528–529). Relational mentoring emphasises mutuality and reciprocity in the mentee–mentor dyadic members, rendering them concerned about each other's needs (Hale & Phillips, 2019). Relational functions take mentoring beyond the traditional hierarchical relationship that rarely fits the dynamic and complex context of healthcare settings (Kakyo et al., 2021). The healthcare workplace is characterised by people at different stages of their careers, causing an asymmetry in competencies that is not always related to demographics such as age and years of practice. For example, the fact that some nurses leave the practice and return later means the mentee is not always younger. Further, advancements in technology mean new graduates may have much to teach senior nurses regarding the latest developments in technology. Relational mentoring results in an affective bond that requires time and commitment (Fullick-Jagiela et al., 2015; Hale & Phillips, 2019), as well as other mentoring costs.

The PCM scale measures the participant's anticipated cost of supporting other nurses and midwives in a mentoring relationship (Ragins & Scandura, 1999). As mentoring involves a workplace developmental relationship (Fullick-Jagiela et al., 2015), prospective mentors can be hesitant to perform the role for two reasons: the risk of being associated with a below-average mentee or worry that a mentee will eventually take over their job (Ragins & Scandura, 1999). Entering a mentoring relationship with these perceptions can affect the experiences and outcomes of the relationship. For example, the perceived cost of mentoring (PCM) has implications for future intentions to engage in mentoring programmes (Małota, 2019; Ragins & Scandura, 1994).

The NME scale measures the level of dysfunctionality in the mentee–mentor dyadic members (Eby et al., 2000). Contractual obligations in formal mentoring programmes may result in an unwilling mentor being unavailable to the mentee (Lin et al., 2018). Sometimes, the mentoring relationship is affected by a mismatch between the mentor and mentee based on factors such as gender, age and cultural differences (Kakyo et al., 2021). Mentoring relationships in the workplace also requires the person in a mentoring capacity to possess the right competencies to meet the needs of the mentee (Kramer et al., 2021). Any deficiencies in skills and expertise can cause dysfunctionality in the relationship (Lin et al., 2018). Negative mentoring experiences (NMEs) have implications for the career, psychosocial, relational and organisational outcomes of mentoring programmes (Huang & Weng, 2017).

The adaptation of the PCM, NME and RMI scales to measure the outcomes of mentoring programmes in the sociocultural context of a developing country presents challenges. First, a cultural context means that mentoring concepts carry different meanings (Geber & Keane, 2017). These scales are in English and adapted for use in a country where English is a second language. Consequently, the scales may carry different and diverse meanings to the original. Second, social context affects the mentoring relationship, organisational climate and greater society in which the stakeholders—the mentee, the mentor and the organisation—are situated (Lescano et al., 2019). Therefore, validation and evaluation of the scales used to measure the outcomes of mentoring programmes need to engage those affected by the programmes.

AIM

The aim of this study was to adapt three scales—PCM, NME and RMI—for use in the acute care hospitals in Uganda.

METHODS

Study design

This study used a cross-sectional study design in accordance with the cross-cultural adaptation guidelines (Epstein et al., 2015).

Setting and sample

This study was conducted in acute care hospitals in Uganda. The participants involved in assessing content validity were experts in various practice areas of nursing and midwifery, ranging from critical care to maternal health to clinical education. The participants of the psychometric evaluation study were nurses and midwives working in acute care hospitals in Uganda. A sample size of 303 was sufficient for the evaluation of psychometric properties (Tabachnick & Fidell, 2021).

Data collection

Data were collected online via Qualtrics between June and October 2021. The link to the survey was shared on WhatsApp groups affiliated with nursing and midwifery associations. The survey link was also shared on WhatsApp groups affiliated with hospitals in Uganda. Participants were encouraged to share the survey link with their colleagues in the profession. Upon clicking on the survey link, participants were redirected to a participant information page that explained the benefits and risks of participating in the study, as well as instructions for withdrawal from the study. The page that followed consisted of consent statements that participants were required to check to indicate their willingness to participate in the study. Once participants had consented, they were able to access the survey.

Scales used in the study

Questions about participant characteristics formed the first section of the survey. Participants were asked about their gender (female, male and others), highest qualification ('Bachelor's degree and above' and 'diploma and below'), number of years they had practised as nurse/midwife, type of professional registration (nurse, midwife and both) and type of facility they worked for (public and private hospital).

The PCM scale comprises 13 items and is measured on a 7-point scale (Ragins & Scandura, 1994). The higher the score, the greater the participant's perception that mentoring is costly. The PCM scale consists of five subscales: '*more trouble than worth, dysfunctional relationship, nepotism, bad reflection and energy drain*' (Ragins & Scandura, 1999).

Two subscales from the NME scale were adapted: the *lack of mentor expertise* subscale and the *mismatch between the dyad* subscale. The *lack of mentor expertise* subscale comprises seven items, while the *mismatch between the dyad* is a nine-item subscale (Eby et al., 2000). Both subscales are measured on a five-point Likert scale (Eby et al., 2004).

The RMI scale is a 21-item scale and had a Cronbach's alpha of 0.97 in a previous study (Ragins, 2012). The RMI scale consists of five subscales—'*personal learning and growth, inspiration, self-affirmation, reliance on communal norms, shared*

influence and respect, and trust and commitment'—measured on a seven-point Likert scale (Ragins, 2012).

Data analysis

The data were analysed using SPSS version 27. The continuous data were analysed using means and standard deviation, while categorical variables were analysed using frequencies and percentages. Missing data analysis was undertaken to assess the pattern of missingness. Little's MCAR test was significant (Chi-square = 2,522.579, df = 2,120, Sig. = 0.000), indicating a possibility that the data were missing at random (Tabachnick & Fidell, 2021). Literature indicates that maximum likelihood approaches are the most appropriate methods for handling this pattern of missingness (Newman, 2014; Tabachnick & Fidell, 2021). Therefore, we used the expectation maximisation algorithm to treat the missing data.

Psychometric evaluation

We undertook psychometric evaluations, as detailed in the following sections.

Content validity

Eleven nurse/midwives were approached and asked to rate the appropriateness of the items of each scale on a four-point scale (1 = not appropriate, 2 = somewhat appropriate, 3 = quite appropriate and 4 = highly appropriate). We used 80% agreement (combining 'Quite appropriate' and 'Highly appropriate') on each item as a cutoff point in the content validity evaluation. This was done in two rounds. The item content validity index (I-CVI) for each item and the scale content validity index (S-CVI) for each scale were used in the analysis (Polit & Beck, 2021). Participants were encouraged to make free comments regarding the suitability of each item on the scales. In round one, items with an I-CVI of less than 0.8 were revised based on comments from experts (Polit & Beck, 2021).

Construct validity

Factor analysis
Exploratory factor analysis (EFA) was performed using principal component analysis (PCA) with a promax rotation to determine the underlying structure of the scales (Tabachnick & Fidell, 2021). Factors with eigenvalues greater than 1 and factor loading greater than 0.5 were retained (Costello & Osborne, 2005; Polit & Beck, 2021). In determining the adequacy of the sample, the Kaiser–Meyer–Olkin (KMO) measure was noted, and Bartlett's test of sphericity was used to determine the adequacy of the correlation matrix (Tabachnick & Fidell, 2021).

Convergent validity

Convergent validity refers to the degree to which the new or adapted scale is related to other theoretically relevant concepts (Polit & Beck, 2021). Informed by the ICN recommendations that nurses need to demonstrate a willingness to engage in supportive activities with novice nurses, social exchange theory was used to assess convergent validity. The social exchange theory by Blau (1964) is a well-known theory that describes an individual's motivations to participate in certain behaviour. According to the theory, individuals subconsciously evaluate the cost of engaging in an activity before they consider taking part in that activity (Blau, 1964). Previous experiences with mentoring relationships affect future decisions to engage in mentoring (Małota, 2017; Ragins & Verbos, 2017). Therefore, quality mentoring relationships are likely to increase nurses' willingness to participate in future mentoring programmes, while NMEs decrease nurses' willingness to participate in future mentoring programmes. Based on the social exchange theory (Blau, 1964) and the aforementioned reasoning, we used Pearson's correlations to determine the relationship between the 'willingness to participate in future mentoring programmes', which is a single item ranked on a 10-point Likert scale, and the three scales (PCM, NME and RMI) to measure convergent validity. We hypothesised that the PCM would be negatively related to willingness to participate in future mentoring programmes (hypothesis 1); NMEs would be negatively related to willingness to participate in future mentoring programmes (hypothesis 2); and the quality of mentoring, as measured by the RMI scale, would be positively related to willingness to participate in future mentoring programmes (hypothesis 3).

Discriminative validity

Discriminative validity measures the ability of a scale to differentiate between groups of participants that it should theoretically distinguish (Polit & Beck, 2021). We determined discriminative validity by comparing the difference in mean scores on the PCM, NME and RMI scales between groups that had or had not ever received mentorship training. We hypothesised that the group that had not received any mentoring training would perceive mentoring to be more costly than the group that had received training in mentoring (hypothesis 4), NME would be more likely to occur among the group that had not received any mentoring training compared with the group that had received training in mentoring (hypothesis 5), and the quality of relational mentoring would be more likely to be higher for the group that had received any mentoring training compared with the group that had not received any mentoring training (hypothesis 4).

Reliability tests

Test–retest reliability was evaluated using the intra-class correlations on 10% (*n* = 30) of the sample size based on a two-week interval (Polit & Beck, 2021). We noted the intra-class correlations coefficient (ICC) (Polit, 2014). The appropriate ICC for the test–retest reliability is one that selects the two-way mixed model for single-rater studies and the absolute agreement as the desired agreement (Koo & Li, 2016). *Internal consistency* was evaluated using Cronbach's alpha (Portney, 2020).

RESULTS

Demographic characteristics

We recruited 11 participants to the content validity of the study: one was a doctorate-prepared nurse, five had a master's degree, and the other five were bachelor-prepared nurses and midwives. A total of 303 participants participated in the main study that evaluated the psychometric properties of the scales. On average, a participant in the main study was 33.4 ($\pm$ 8.52) years old with their age ranging between 20 and 58 years. The participants professional years of experience ranged from 0.25 to 34 years with an average work experience of 8.69 ($\pm$ 6.83) years. The majority were female (69.6%), nurses (61.1%) and working in public hospitals (78.5%).

Psychometric evaluation

Content validity

Three items on the PCM scale, two items on the NME scale and four items on the RMI scale scored less than 0.8 in round one of the expert reviews. Comments from the expert panel indicated punctuation and typing errors, concerns with word choice and noticeable similarities between items. Some words were changed in accordance with experts' suggestions, where appropriate. For example, one item, 'A poor mentee can ruin a mentor's reputation', had an I-CVI of 0.54. The comments for this item showed that the experts did not agree with the choice of the word 'poor' as that carried a financial meaning. Some of the experts suggested that the word be replaced with 'underperforming mentee'. Therefore, this item on the PCM scale was reworded to read, 'An underperforming mentee can adversely affect a mentor's reputation'. Comments on the similarity between items such as 'My mentor and I have dissimilar personalities' and 'My mentor and I are different from one another' were addressed by expounding reviewer instructions to explain that the similarity between items was because the items measured the same construct in the scale. The revised scale items were returned to the experts in round two for scoring. The final I-CVI of all items was between 0.8 and 1.0. The final S-CVI for the PCM, NME and RMI scales were 0.93, 0.94 and 0.89, respectively.

Construct validity

Exploratory factor analysis

Factor analysis of the PCM scale. EFA was carried out in steps. In the initial EFA, the correlation matrix was evaluated for factorability and showed that the KMO measure of sampling adequacy was 0.830 and that Bartlett's test of sphericity was significant (χ^2 = 628.6, df = 78, p < 0.001), returning a non-zero determinant of 0.120. These parameters support the suitability for PCA (Tabachnick & Fidell, 2021). PCA with promax rotation was performed for the 13 items. This extracted four factors with eigenvalues greater than one. One item was deleted because it had a cross-loading between two factors greater than 0.4 and EFA ran again. Three items that had a factor loading of less than 0.5 were then deleted and the analysis was repeated. The final EFA showed three factors: risk to reputation, mentoring effort and nepotism as shown in Table 1.

Factor analysis of the NME scale. The data were examined for factorability. The correlation matrix of the 16 items showed that the KMO measure of sampling adequacy was 0.888 and that Bartlett's test of sphericity was significant (χ^2 = 1455.6, df = 120, p < 0.001), returning a non-zero determinant of 0.007. These parameters indicated the suitability for PCA (Tabachnick & Fidell, 2021). The data set was then subjected to PCA, which extracted two factors with eigenvalues greater than one. Promax rotation was then performed (Polit & Beck, 2021). One item, 'My work strategies are different from my mentor's' was also deleted due to cross-loading of greater than 0.4 and another item 'My mentor and I have a different understanding of effective work performance' was then deleted because of a low factor loading of less than 0.5. The final analysis shows two factors consistent with the original NME scale. The names of the factors were retained as *lack of mentor expertise* and *mismatch between the dyad*, which accounted for 47.7% of the variance (Table 1).

Factor analysis of the RMI scale. The data set was examined for factorability. The correlation matrix of the 21 items showed that the KMO measure of sampling adequacy was 0.951 and that Bartlett's test of sphericity was significant (χ^2 = 3,594.1, df = 210, p < 0.001), indicating a non-zero determinant. These parameters support the suitability for PCA (Tabachnick & Fidell, 2021). The data set was then subjected to PCA, which extracted two factors with eigenvalues greater than one. Promax rotation was then performed with a goal of 0.5 factor loading per item. Three items were removed from the analysis to low loadings of less than 0.4. Item 16, 'My colleague/or supervisor and I respect and influence each other', was conceptually related to factor two but loaded on factor one; therefore, it was also deleted. The final EFA showed

TABLE 1 Results of the factor analysis, reliability tests and content validity evaluation for the three scales ($n = 303$).

Item No.	Scale items Perceived cost of mentoring	Factor 1	Factor 2	Factor 3
	Factor 1: Risk to reputation			
11	Mentees can be a negative reflection of the mentor's competency.	0.795		
10	An underperforming mentee can adversely affect a mentor's reputation.	0.745		
5	Mentors can be betrayed by opportunistic mentees.	0.650		
	Factor 2: Mentoring effort			
1	Mentoring takes more time than it's worth.		0.788	
2	Mentoring takes too much time away from one's own job.		0.684	
13	Mentoring is an energy-draining process.		0.679	
	Factor 3: Nepotism			
8	Mentors run the risk of being viewed as developing a political cadre (circle or clique) with their mentees.			0.753
7	Mentors are often viewed by others as giving unfair advantages to their mentees.			0.712
6	Members of the organisation often view mentors as playing favourites with a mentee.			0.618
	Eigenvalues	2.69	1.12	1.03
	Explained variance %	29.9	12.5	11.4
	Cronbach's alpha	0.599	0.555	0.527
	Intra-class correlations	0.447	0.458	0.583

Item No.	Scale items Negative mentoring experiences	Factor 1	Factor 2
	Factor 1: Mismatch between the dyad		
6	My mentor and I have a different personal character.	0.812	
8	My mentor and I have dissimilar personalities.	0.754	
9	My mentor and I are different from one another.	0.692	
1	The personal values of my mentor are different from my own.	0.687	
7	Comparing myself to my mentor, I would say our temperaments (personalities) are different.	0.683	
2	My mentor and I have different life priorities.	0.671	
3	My mentor and I have different work habits.	0.614	
	Factor 2: Lack of mentor expertise		
10	My mentor lacks expertise in areas that are important for the type of work he/she does.		0.701
13	My mentor does not know much about the hospital system.		0.694
14	My mentor is not a high performer on the job.		0.671
11	I have my doubts about my mentor's job-related skills.		0.663
15	My mentor lacks the interpersonal skills necessary to show sensitivity when appropriate.		0.647
16	My mentor does not communicate well.		0.614
12	My mentor can't teach me anything I don't already know.		0.603
	Eigenvalues	4.62	2.06
	Explained variance %	33.0	14.7
	Cronbach's alpha	0.829	0.788
	Intra-class correlations	0.385	0.535

(Continues)

TABLE 1 (Continued)

	Scale items Relational mentoring index	Factor 1	Factor 2
	Factor 1: Individual influence		
4	My colleague/or supervisor has inspired or been a source of inspiration for me.	0.862	
7	My colleague/or supervisor helps me learn more about myself.	0.831	
3	My colleague/or supervisor is helping me become the person I aspire to be.	0.827	
6	I am often inspired by my colleague/or supervisor.	0.817	
5	My colleague/or supervisor gives me a fresh perspective that helps me think 'outside the box'.	0.793	
10	My colleague/or supervisor brings out the best in me.	0.753	
9	My colleague/or supervisor always sees the best in me.	0.673	
1	My colleague/or supervisor is helping me learn and grow as a person.	0.665	
2	My colleague/or supervisor helps me learn about my personal strengths and weaknesses.	0.651	
8	My colleague/or supervisor sees me not only for who I am now but also for who I aspire to be.	0.609	
	Factor 2: Relational quality		
15	We give to each other without expecting repayment.		0.831
13	In our relationship, we help each other without expecting repayment.		0.793
12	I can be myself with my colleague/or supervisor.		0.690
14	We never keep track of who gives and who gets in our relationship.		0.686
21	Trust and commitment are central to our relationship.		0.656
19	Our relationship is founded on mutual trust and commitment.		0.571
17	We respect each other, and we value what each person has to say.		0.513
	Eigenvalues	8.10	1.38
	Variance explained	47.6	8.14
	Cronbach's reliability	0.927	0.828
	Intra-class correlations	0.638	0.409

two factors: *individual influence* and *relational quality*. These explained 55.7% of the variance (Table 1).

Convergent validity

The total score on the PCM scale had a significantly negative association with willingness to participate in future mentoring programmes ($r = -0.165$, $p < 0.01$). However, factor 3, *mentoring effort*, had a non-significant negative association with willingness to participate in future mentoring programmes (Table 2). Therefore, hypothesis 1 was partly supported. NMEs had a significantly negative relationship with willingness to participate in formal mentoring in the future ($r = -0.142$, $p < 0.05$). However, factor 1, *mismatch between the dyad*,

had a non-significant association. Therefore, hypothesis 2 was partly supported (Table 2). The quality of mentoring, as measured by the RMI scale, had a significantly positive association with willingness to participate in formal mentoring in the future ($r = 0.224$, $p < 0.01$). Therefore, hypothesis 3 was supported (Table 2).

Discriminative validity

The group that had some mentoring training experience had a lower score on the PCM and NME scales and a higher score on the RMI scale compared with the group that did not have any training, although the mean differences did not reach statistical significance (Table 3). Therefore hypotheses 4, 5 and 6 were not supported.

TABLE 2 Correlations among PCM, negative cost of mentoring and RMI variables.

	Variable	1	2	3	4	5	6	7
1	Willingness to participate in future mentoring programmes	1						
	Perceived Cost of Mentoring	−0.165**						
2	Factor 1: Risk to reputation	−0.113*	1					
3	Factor 2: Nepotism	−0.153*	0.371**	1				
4	Factor 3: Mentoring effort	−0.060	0.334**	0.312**	1			
	Negative Mentoring Experiences	−0.142*						
5	Factor 1: Mismatch between the dyad	−0.071	0.273**	0.310**	0.205**	1		
6	Factor 2: Lack of mentor expertise	−0.171**	0.162**	0.168**	0.221**	0.396**	1	
	Relational Mentoring Index	0.224**						
7	Factor 1: Individual influence	0.201**	−0.047	−0.011	0.023	−0.105	−0.309**	1
8	Factor 2: Relational quality	0.195**	0.057	0.032	0.009	−045	−0.198**	0.700**

*p < 0.05, **p < 0.01.

TABLE 3 Discriminative validity for the PCM, negative cost of mentoring and RMI scales (n = 303).

Scale (M ± SD)	Yes, Training in mentoring (n = 138) M ± SD	No, Training in mentoring (n = 165) M ± SD	t	P value
PCM (4.12 ± 1.05)	4.08 ± 1.00	4.13 ± 1.10	−0.441	0.660
NME (2.98 ± .581)	2.92 ± 0.563	3.02 ± 0.600	−1.41	0.160
RMI (5.49 ± 1.01)	5.60 ± 0.964	5.40 ± 1.05	1.78	0.080

M, mean; SD, standard deviation.

Reliability tests

Test–retest reliability
The ICC for the total score on the PCM scale was 0.609 (95% CI: 0.324−0.793), indicating the moderate stability of the scale. For the respective constructs, the results were as follows: *risk to reputation* had an ICC of 0.447 (95% CI: 0.122−0.689), *mentoring effort* had an ICC of 0.458 (95% CI: 0.119−0.700) and *nepotism* had an ICC of 0.583 (95% CI: 0.282−0.778). These indicate the poor to moderate stability of the constructs (Table 1).

The ICC for the total score on the NME scale was 0.568 (95% CI: 0.271−0.767), indicating the moderate stability of the scale. The test–retest results for the respective constructs were as follows: *mismatch between the dyad* had an ICC of 0.385 (95% CI: 0.056−0.645) and *lack of mentor expertise* had an ICC of 0.535 (95% CI: 0.222−0.748). These indicate the poor to moderate stability of the constructs (Table 1).

The ICC for the total score on the RMI scale was 0.664 (95% CI: 0.410−0.824), indicating the moderate stability of the scale. For the respective constructs, the results were as follows: *individual influence* had an ICC of 0.638 (95% CI:

0.364−0.810) and *relational quality* had an ICC of 0.409 (95% CI: 0.058−0.669). These indicate the poor to moderate stability of the constructs (Table 1).

Internal consistency
The Cronbach's alpha of the overall PCM scale was 0.705, and that of each factor ranged between 0.527 and 0.599 (Table 1), indicating average consistency for the entire scale and marginal consistency for the constructs. Further, the item-to-total correlation ranged between 0.320 and 0.408.

The Cronbach's alpha of the adapted NME scale was 0.841, and that of each factor was 0.829 and 0.788 (Table 1), indicating high consistency for the entire scale and the constructs. Further, the item-to-total correlation ranged between 0.288 and 0.581.

The Cronbach's alpha of the adapted RMI scale was 0.933, and that of each factor was 0.927 and 0.828 (Table 1), indicating high consistency for the entire scale and the constructs. Further, the item-to-total correlation ranged between 0.385 and 0.747. These values are within the recommended ranges (Krabbe, 2017), indicating the unidimensionality of the RMI scale.

DISCUSSION

The initial step towards cross-cultural adaptation of the mentoring scales was performed in accordance with the guidelines presented in the literature (Epstein et al., 2015). As mentoring for nurses and midwives in Uganda has been under-researched, it was necessary to involve stakeholders to adapt the mentoring scales with the potential for use in evaluating future mentoring programmes for nurses working in hospitals in a country in which English is a second

language. Further, emphasising the importance of mentoring in supporting novice professionals and continuing professional development (International Council of Nurses, 2021), it is important to understand the negative and positive experiences that arise from mentoring relationships.

The PCM scale

The preliminary findings in our study revealed a structure of the PCM that was comparable with the original scale, although our study explained less variance (53.8%) than the original scale (Ragins & Scandura, 1999). The final PCM scale in our study consisted of 9 of the original 13 items with 3 factors compared with 5 factors in the original study. The PCM has been used in a study that showed a non-significant negative correlation between the PCM scale and willingness to mentor ($r = -0.146$) (Khunou, 2018). The internal consistency of the entire 9 items ($\alpha = 0.705$) in our study was similar to the previous study ($\alpha = 0.739$) (Khunou, 2018). The findings indicate that the adapted PCM scale can be used for nurses working in clinical settings in a developing country.

The NME scale

Originating in the USA (Eby et al., 2000), the NME scale has been developed and adopted for different settings outside of nursing and midwifery practice (Ayoobzadeh, 2018). In our study, 12 of the 16 adapted NME scale items were retained following the EFA. These items loaded into two distinct factors consistent with the original study on the scale: *mismatch between the dyad* and *lack of expertise* (Eby et al., 2004). In our study, the constituent components of the NME scale demonstrated relatively high internal consistency ($\alpha = 0.841$) akin to a previous study ($\alpha = 0.93$) (Ayoobzadeh, 2018).

The RMI scale

In our study, the 17 items extracted from the RMI scale yielded two distinct constructs: *individual influence* and *relational quality*, which differ from Ayoobzadeh's single construct and Van Esch's six-factor model (Ayoobzadeh, 2018; Van Esch, 2017). The differences underscore the need to validate the scale in a social context. Moreover, in our study, the convergent validity test showed a positive correlation between the RMI and the intention to engage in future mentoring. Our finding aligned with a previous study that revealed a positive correlation between RMI and motivation to mentor ($r = 0.20$, p < 0.05) (Srivastava & Thakur, 2013). In our study, the adapted 17-item RMI scale exhibited commendable internal consistency ($\alpha = 0.93$), similar to two previous studies (Ayoobzadeh, 2018; Van Esch, 2017).

The study has some limitations. First, we only employed EFA to evaluate the psychometric properties of the three mentoring scales. Future studies need to consider the use of confirmatory factor analysis to validate the factor structures of these scales using a different sample. Second, we used an online survey to collect data. This data collection method is associated with sampling bias (Newman et al., 2021). Online surveys access a particular population with specific demographic characteristics, particularly those with access to the internet and technology, that is, smartphones or computers.

CONCLUSIONS

Countries that use English as a second language often adopt existing scales to measure concepts in their clinical settings. In this cross-sectional study, the findings show that there can be differences in their psychometric properties, with implications for the interpretation of the findings. The preliminary efforts at contextual adaptation of the RMI scale showed two constructs: *individual influence* and *relational quality*. The process of adapting the NME scale presented no challenges, showing consistency with previous use. However, the PCM scale had low internal consistency, suggesting a need for a more comprehensive evaluation of this scale within a larger, contextually similar sample.

IMPLICATIONS FOR NURSING AND HEALTH POLICY

The study has implications for nursing and health policy. First, mentoring programmes sponsored by the government, nursing and midwifery organisations and healthcare facilities must be rigorously evaluated using contextually adapted and validated mentoring scales. Policy documents relating to mentoring programmes for nurses and midwives must incorporate detailed information about mentoring programme evaluation methods and recommend key performance indicators (KPIs). Second, the three mentoring scales that have been culturally adapted and validated in the Uganda hospital settings can be used to measure some KPIs of the mentoring programme. For example, the RMI scale emphasises the reciprocal relationship between mentees and mentors, which can be considered a KPI in mentoring programmes.

Moreover, the PCM scale focuses on the negative perceptions of mentors. This instrument can measure the effect of mentor support and training provided in mentoring programmes that aim to avoid such negative perceptions. In addition, the NME scale measures the NMEs of the mentees. As a KPI, this instrument has the potential to detect any dysfunctional relationships to address the hostility for better mentoring outcomes.

AUTHOR CONTRIBUTIONS

All authors have equally contributed to the design and writing of the manuscript as follows: Study design: TAK, LDX, DC; data collection: TAK; data analysis: TAK, LDX, DC; manuscript writing: TAK, LDX, DC.

CONFLICT OF INTEREST STATEMENT

No conflict of interest has been declared by the authors.

ETHICS STATEMENT

Ethics approval was obtained from the Flinders University Human Research Ethics Committee (Project number: 4525) and The TASO Research Ethics Committee (Project number: TASOREC/056/2021-UG-REC-009).

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