Developing a robust tool: Advancing the multiple mini interview in pre-registration student midwife selection in a UK setting

Abstract

Background: Published research has shown the multiple mini interview (MMI) to be a reliable assessment instrument in medical and nursing student selection internationally.

Objectives: To develop, pilot and examine the reliability of MMIs in pre-registration student midwife selection in one Higher Education Institution a UK setting.

Design and setting: BSc (Hons) Midwifery Studies students at a Higher Education Institution in the UK volunteered to participate in 'mock' MMI circuits during the first week of their programme. DeVellis's framework for questionnaire development underpinned the generation of interview scenarios. Participants' responses to scenario questions were rated on a 7 point scale. Internal consistency was calculated for each station.

Results: An eight station model was piloted. Communication skills were assessed at each station as a generic attribute. Station specific attributes assessed included compassion and empathy, respect for difference and diversity, honesty and integrity, intellectual curiosity and reflective nature, advocacy, respect for privacy and dignity, team working and initiative, the role of the midwife and motivation to become a midwife.

Cronbach's alpha scores for each station ranged from 0.91 – 0.97.

Conclusion: The systematic development of the MMI model and scenarios resulted in 'excellent' reliability across all stations. These findings endorse the MMI technique as a reliable alternative to the personal interview in informing final decisions in pre-registration student midwife selection.

Key Words: Multiple mini interviews, selection, recruitment, values and attitudes, emotional intelligence

Introduction

Recruiting and selecting students onto nursing and midwifery preparation programmes is a complex and multilevel process. In The United Kingdom (UK) students are initially shortlisted according to their intellectual ability. This is measured by previous academic success. To meet the UK Nursing and Midwifery Council Standards for Midwifery Education (2009) the personal interview is then widely used to inform final decision making. This traditional interview format is predisposed to the potential effects of context specificity, examiner bias or chance (Eva et al., 2009). The power of the personal interview to assess an individual's propensity to care or to identify those most likely to be able to meet patients' multifarious needs has been questioned in medical student selection (Wilson et al., 2012). There is a dearth of evidence available specifically relating to student midwife selection. Training for interviewers in nursing and midwifery recruitment is also limited. Rodgers et al. (2013) found most Higher Education Institutions in the UK use untested scoring and assessment instruments.

In the UK National Health Service (NHS) pervasive deficiencies have been identified in the provision of compassionate care (Francis, 2013). The resulting mandate from the Government specifies that the student nurses and midwives who are recruited should have the capacity to deliver high quality compassionate care (Department of Health, 2013). A clear emphasis is placed on selecting nurses and midwives for training based on caring values, including compassion and empathy, as well as technical and academic skills (Department of Health, 2013).

The intrinsic complexities associated with appraising individuals' values and attitudes cannot be understated. How can an individual's propensity to care be assessed? What is it that defines human caring and what is at the "core" of a caring moment? Childbirth is an emotionally charged event which can be transformed by the midwife-mother relationship. The significance of this relationship is well documented both from mothers' (Kirkham, 2000) and midwives' (Walsh, 2007) perspectives. Mutual reciprocity where both mother and midwife feel recognised and valued contributes towards a satisfying and enriching relationship (Hunter, 2006). Fundamentally however, women report more positive experiences when both their emotions and those of their midwife are effectively managed, generating meaningful connection and trust (Hunter, 2013). This includes an awareness of the midwife's personal feelings, attitudes, beliefs and expectations. Emotions are inextricably bound to a caring moment and how an individual manages their emotions is a key component of the quality of care provided (Hunter and Deery, 2009). 'Emotional intelligence' is a construct which attempts to define an individual's ability to combine emotions with intelligence (Goleman, 1996). Akerjordet and Severinsson (2004) suggest emotional intelligence implies important personal and interpersonal skills in individuals' therapeutic use of self. Lopes et al. (2006) describes an association between emotional intelligence and social interaction. He suggests that emotions serve communicative and social functions, conveying information about people's thoughts, intentions and contributions to

social encounters. Lopes et al. (2006) critiques the epistemological foundations of the construct of emotional intelligence by suggesting that cultural differences in emotional expression will effect reliability and validity measures. This is particularly relevant when care is provided in a multi cultural society where social norms and assumptions may not translate across cultural boundaries. The provision of maternity services that offer care at their heart will depend on recruiting and educating emotionally intelligent individuals (Hunter and Smith, 2007). How can emotional intelligence be measured? Emotional intelligence tests are available (Mayer et al., 2002; Bar-On, 1997; Schutte et al., 1998) but their efficacy has been questioned (Furnham, 2006). In addition Lyon (2013) considers whether these tests are able to measure empathy; an attribute at the core of human caring as well as underpinning emotional intelligence theories. The fundamental complexities of assessing personal attributes are not under estimated from reliability, validity and social perspectives. It could be suggested that to assign a quantitative construct to what are arguably fluid, interpretive phenomena is attempting to measure the unmeasurable. The reality faced by training institutions internationally however, is that difficult decisions do have to be made regarding applicants' personal attributes and suitability for a career in healthcare (O'Brien et al., 2011). Research to develop robust tools to inform these important decisions is ongoing.

This paper examines how an alternative admissions instrument, the multiple mini interview (MMI) was developed and piloted in pre-registration student midwife selection in a UK Higher Education Institute (HEI).

Background

Multiple Mini Interviews
The multiple mini interview (MMI) is an admissions tool designed to replace the personal interview. Initially developed at McMaster University, Ontario (Eva et al., 2004) it has been adopted in medical, nursing and midwifery training institutions internationally (Eva et al., 2004; Roberts et al., 2008; McBurney and Carty, 2009; O'Brien et al., 2011; Husbands and Dowell, 2013; Perkins et al., 2013). The MMI model represents an objective structured clinical examination (OSCE) style format where components of competence are assessed in a structured way (Harden, 1979). Candidates are asked to respond to questions relating to a specific scenario at a 'station' and then move onto the next station in a timed circuit. Scenarios are not clinically based as they are not designed to measure clinical knowledge. The MMI model used by different training institutions has evolved to complement individual programme specific needs. First models used ten, eight minute stations with a two minute break between (Eva et al., 2004), while others have moved to an eight station design with five minutes at each station (O'Brien et al., 2011).

Proponents argue that the aggregate of multiple observations generated represents a more generalizable assessment of an individual's personal attributes than the personal interview. The

personal interview traditionally involves one or two interviewers questioning a candidate. Interviewers have candidates' application information available which may influence their decision making. In the MMI the potential effect of examiner bias or chance is moderated as interviewers have no prior knowledge of candidates (Eva et al., 2004, O'Brien et al., 2011). Content validity is ensured as the personal values and attributes assessed are tailored to reflect specific programme philosophies (Roberts et al., 2008). In medical student selection for example O'Brien et al. (2011) appraised applicants' communication and decision making skills, ability to critically think and debate complex issues.

A standardised interviewer assessment proforma accompanies each station to optimise inter-rater reliability. Interviewers score candidates using a five or seven point Likert-type scale as well as assigning a global rating score which can range from 'excellent' to 'cause for concern' (O'Brien et al., 2011). The internal consistency of the MMI has been examined in medical student selection. Eva et al (2004) reported a median reliability of 0.73 across eight MMI administrations using different students while O'Brien et al. (2011) calculated reliability equal to 0.69-0.73.

This report presents selected findings from a wider study which aimed to evaluate the assessment efficacy of the MMI. Assessment efficacy incorporated reliability (internal consistency), predictive validity, acceptability and usability from candidate and interviewer perspectives. The rationale for this paper is that no published research to date has specifically focused on developing and testing the reliability of MMIs in pre-registration student midwife selection in a UK setting.

Aims:
To develop, pilot and examine the reliability of MMIs in pre-registration student midwife selection in a HEI in the UK.

Methods

Design
A dual paradigmatic approach incorporating mixed methods was used in a concurrent embedded case study (Creswell and Clark, 2011). Greene et al.'s (1997) philosophical position underpinned this research which rejects a single paradigm perspective in favour of a pluralistic stance. Each paradigm and associated methods offers a legitimate and meaningful perspective, generating in-depth multidimensional knowledge and understanding (Creswell and Clark, 2011). By adopting this philosophical position in the wider study it was possible to estimate reliability and validity as well as exploring more in depth user perspectives.

Data collection and participants

Recruitment took place between September 2010 and September 2012 at a University in the South East of England. Two consecutive cohorts of students who had been accepted onto a BSc (Hons) Midwifery Studies programme were recruited into the study during their Introductory Week. Both cohorts attended a presentation about the study and received written information and consent forms. This was followed by a meeting several days later to provide an opportunity for further clarification and to collect signed consent forms. All participants were reassured that their MMI

score would be kept confidential and that it would have no subsequent impact on their programme. All participants were assigned a study identification number which they wore during their MMIs. Exclusion criteria applied where no other pre or post registration midwifery cohorts were included. The final sample size was n=62 participants.

Approval from the University Ethics Committee was obtained to conduct "mock" MMIs on these students who had already been accepted on to the Midwifery studies programme. Neither the University Ethics Committee or the University Admissions Board would allow the recruitment of students using non-piloted tools with un-assessed reliability and validity specifically in midwifery student selection. Limitations associated with this are acknowledged and discussed later in this paper.

Results

Multiple Mini Interview Instrument Development

MMI models and scenarios had been validated by xxx in medical student recruitment at the commencement of this research. However, none were available specifically relating the student midwife selection in the UK. The researcher recognised the potential inaccuracies associated with using instruments of questionable suitability. Developing an assessment instrument presents complex challenges. Questions that "look right" are not necessarily reliable or valid. The principles underpinning DeVellis's (2003) model for scale development were adopted. DeVellis's model was designed to inform the development of psychometric tools in the form of self-report questionnaires exploring people's beliefs and attitudes. While MMIs are not self-report tools the principles DeVellis describes to underpin the development a robust tool within a social science paradigm were considered applicable. The model assumes that existing literature has been consulted and that no valid measurement scale, in this case MMI scenarios exist. DeVellis (2003) proposes the following eight step approach:

Step 1: Determine what you want to measure: DeVellis (2003) advocates thinking carefully about the constructs to be measured as this can be more complex than the researcher may have initially appreciated. Clarity and unambiguity is vital. It was essential to ensure that the attributes being assessed were ones that reflected those considered desirable of a student midwife as well as upholding the University's midwifery programme philosophy (should I say what this is?). A structured literature search revealed that mothers have a definitive idea of the values and behaviour they desired from their care provider (Homer et al., 2009). These were recorded and compared to those encapsulated by the UK Nursing and Midwifery Council (2009) and International Confederation of Midwives (2011). In addition midwives views of a "good" midwife were elucidated (Byrom and Downe, 2010). A variety of constructs were identified including communication skills, honesty and integrity, kindness, compassion, caring, empathy, respect for difference and diversity, awareness of the role of the midwife, intellectual curiosity, advocacy, respect for privacy and dignity, team working, initiative and problem solving. This 'blueprint' was reviewed by an expert academic panel of midwifery academics at the University including the Lead Midwife for Education, Senior Lecturer (clinical), two PhDs, one Senior Tutor and four Tutors to ensure that there was agreement that it accurately reflected the midwifery programme philosophy. Effective communication emerged

Comment [A1]: Yes just very briefly and connect back to the stuff on Ei above?

Comment [A2]: Isn't this what you say to defend against why you chose local RMs to be reviewers of the tool? That you were developing something at the end of the day which met your local needs and philosophy. It may be transferable etc but not necessarily generalisable?

as a key skill and value central to all other constructs. The decision was made by the researcher to deviate from others MMI models (Eva et al., 2004 and Roberts et al., 2008) and assess communication skills at every station rather than one specific station.

Step 2: Generate an item pool and begin the process of writing the items: DeVellis (2003) suggests this is the most difficult stage because of the potential ambiguity associated with phrasing statements or questions. This can include lengthy or overtly positive or negatively worded items. Ensuring construct validity of the interviews was a challenge because no validated scenarios were available for pre-registration student midwife selection in the UK in 2010. A structured literature search revealed validated scenarios for medical students internationally. These included Eva et al. (2004, 2009) in Canada, Roberts et al. (2008) in Australia, and O'Brien et al. in England (2011). McBurney and Carty (2009) developed scenarios for nursing student selection at the University of British Colombia. Their scenarios were not replicated in this study as they were potentially unrepresentative of desirable attributes in midwifery students in the UK.

Having appraised the literature scenarios were written in draft form. These were designed to assess the values and attributes elucidated in Step 1.

Step 3: Determine the format for measurement: Each candidate's response to the scenarios was rated on a Likert-type scale. The scale was accompanied by standard descriptors. Each point in the scale was at approximately equal intervals so that the difference in agreement between adjacent pairs of responses was the same as it was for any other adjacent pair of response options (DeVellis, 2003). A seven point scale was adopted. Applications to the Midwifery programme annually exceed the number of places by 20:1. In this competitive climate, distinguishing between high calibre candidates is a challenge. The seven point scale allowed for detailed differentiation between candidates from excellent, to very good, good, satisfactory, borderline, poor and unsatisfactory.

Step 4: Have the initial item pool reviewed by experts: Eva (2004) first developed MMIs in medical student selection in Ontario. McBurney and Carty (2009) went on to adapt Eva's model in nursing recruitment at the University of British Colombia, Vancouver. Both were contacted by email requesting their expert advice and feedback regarding the scenarios and model proposed. Their suggested amendments included: phrasing in the present tense; the inclusion of non clinically based scenarios as the aim was not to test clinical knowledge; omitting any unimaginable hypothetical scenarios or leading questions and ensuring equal weighting of each station scenario to the final score. Scenarios were refined accordingly.

Step 5: Consider inclusion of validated items: DeVellis (2003) suggests that questions should be included which validate the scale. Respondents' may, for example, have other influences that could impact on their responses which could not have been predicted. A station was therefore dedicated to questioning 'why do you want to be a midwife?' This elicited clear insight into candidates' motivation to join the midwifery profession with responses, for example, "I don't know", "I'm not sure between nursing and midwifery", or "I want be a midwife because....."

Step 6: Administer items to a development sample: The proposed model and scenarios were piloted on third year student midwives at the University in July 2011. This was a convenient sample but it

was ensured that these student's profiles were representative of pre-registration student midwives at the University in terms of their age, academic entry point and gender.

Step 7: Evaluate items: Further modifications were made following piloting. These included refining the wording of some questions for clarity, improving the phrasing of the scenarios to make them more concise and changing the formatting by accentuating the questions in bold to help candidates navigate the scenarios, see Box A.

Step 8: Optimise scale length: Published research was consulted regarding the optimal number of scenarios in any one circuit. The researcher questioned whether fewer, longer stations e.g. three, ten minute stations would be more reliable than a greater number of shorter stations e.g. ten, three minute stations. Eva (2004) and Roberts (2008) calculated that increasing the number of stations positively impacted on reliability. Dodson (2009) concluded that reliability increased with length of time at each station. The cost and logistical impact of a greater number of stations and more time at each station are vital practical implications to be considered.

Multiple Mini Interview Model

Taking into consideration published research findings in conjunction with resource implications the researcher elected to pilot an 8 station, 5 minute model (O'Brien et al., 2011). See Box A for attributes assessed. Participants completed MMI circuits within the first week of their training. Box B represents an example scenario designed to assess initiative, problem solving and team work.

Insert Box A here

Insert Box B here

During the minute between stations each interviewer assessed participants at every station on specific elements related to their 'communication skills', 'station specific attribute' and 'global rating'. Assessments for each element were made using a seven point rating scale ('unsatisfactory', 'poor', 'borderline', 'satisfactory', 'good', 'very good' and 'excellent'). Higher scores indicated better performance. The communication skills section was sub-divided into four elements see Box C.

Insert Box C here

The station specific attribute was sub-divided into three elements (see Box D)

Insert Box D here

The 'global rating' took into consideration interviewers' *"overall impression as to the candidates suitability for a career in midwifery taking into account their strength of arguments, ability to perform under pressure and creative thinking".*

Research rigour

To maximise inter-rater reliability interviewers received an hour of training prior to conducting interviews (Lemay et al., 2007). This included detailed information about MMI administration. Interviewers were advised that this was an OSCE-type assessment and dialogue with the candidate was not permitted. To ensure parity of opportunity between candidates no trigger questions were available. Interviewers were only allowed to ask the candidate if they wished the scenario to be repeated or if there was anything else they wanted to add. Interviewers were reassured that the timing of the stations would be governed by an automated Power Point count down with voice over. Interviewers also received an update prior to the second cohort interviews because of the one year time lapse between. Test-retest reliability measures were not feasible in this study due to the anticipated confounding influence of their programme as students progressed through it. Standard descriptors were defined for each point on the rating scale to enhance consistency of scoring amongst interviewers.

To ensure the study's credibility and trustworthiness the researcher did not take part in any interviews or contribute to any participants' MMI scoring. The researcher was a teacher at the University. To avoid any potential conflict of interest none of the participants were her personal tutees and she did not have any contact with them during the period of data collection. Interviewers were academic staff at the University experienced in selecting candidates using the personal interview. No interviewer had any prior knowledge of MMIs either practically or theoretically and all had received the same training and preparation in order to take part in this research. Participants wore identification numbers and data collection took place at the commencement of their programme.

Scores were entered for each candidate into SPSS version 21. A total score for all stations was generated for each candidate by summing the eight elements assessed at each station.

Internal consistency was calculated using Cronbach's alpha for each station. This ranged from 0.91 to 0.97 across all stations: see Table 1

Insert Table 1 here

Discussion

MMIs are being adopted nationally and internationally to inform final decisions in student health care professional recruitment. This is, to the author's knowledge, the first research to be published

which specifically focuses on the development and piloting of MMIs in student midwife selection. Where "off the shelf" questionnaires were not available, rigour was ensured through the systematic development of the assessment tools. DeVellis (2003) theoretical framework for scale development was instrumental in guiding this process.

Reliability was shown to be 'excellent' across all stations. This demonstrated that interviewers used the full range of options in the rating scales and that there was internal consistency in the constructs being measured. Conducting test-retest reliability analysis would have added important information but this was not possible as the candidates themselves may have altered their responses as they developed and progressed through their programme.

Introducing MMIs as a new interview technique and conducting them using the associated model was uneventful. Interviewers were open to embracing this innovation. Consecutive interview cycles ran to schedule which is an important consideration in managing applicants' expectations of their interview day.

A potential limitation of this study is that students who had already been selected using the personal interview and accepted onto the programme took part. It is acknowledged that an optimal design would have been a randomised control trial where applicants to the programme were randomly assigned to either a personal interview arm or an MMI arm. This was not feasible due the constraints imposed by the University admissions processes. An element of self-selection bias is possible as recruitment into the study relied on candidates and interviews volunteering themselves.

Participants were aware that their MMI scores would have no subsequent impact on their programme. This could have resulted in them not taking the process seriously. This was not evident during data collection indeed many came dressed in interview clothing to, as they reported 'focus their minds'.

This study offers robust data regarding the reliability of the MMI in pre-registration student midwife recruitment using the model described and associated assessment tools. One of the reviewer's comments was to include something here about the cost implications of MMIs but Im not sure it is relevant? I could sign post to my previous NET paper which covers this by saying …..it is important to consider these issues but this was not the focus of this paper but more info can be found and ref the paper…yes latter strategy good.

Conclusion

The complexities inherent in selecting the future midwifery workforce in any country worldwide cannot be understated. The vision from a UK policy directive is that compassionate, caring individuals (DoH, 2013) will be recruited who have the capacity to embrace innovation and the rigours associated with meeting patients complex needs. The intricate mix of academic potential and personal attributes is extremely difficult to measure. Describing the process undertaken to develop MMI scenarios in the context of pre-registration student midwife selection adds a unique insight. As a result of this study the HEI will be adopting MMIs for pre-registration student midwife selection in

their 2013-2014 recruitment cycle. The principles underpinning this process are generic and can be extrapolated to other health care professional recruitment processes internationally.

There is an increasing body of research evidence endorsing the MMI tool as a viable alternative to the personal interview. These findings offer a unique perspective specifically relating to pre-registration student midwife selection in a UK setting.

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