Development and Validation of the Australian Midwifery Standards Assessment Tool (AMSAT) to the Australian Midwife Standards for Practice 2018

ABSTRACT:

Background: The Australian Midwifery Standards Assessment Tool (AMSAT) was developed against the Competency Standards for the Midwife in 2017 to enable consistent assessment of midwifery student performance in practice-based settings. The AMSAT requires revision and re-validation as the competency standards have now been superseded by the Midwife Standards for Practice 2018.

Objective: This research revised and validated the AMSAT to assess performance of midwifery students against the Midwife Standards for Practice 2018 and assessed its sensitivity.

Design: A mixed-methods approach was used in a two-phase process. Phase one involved the re-wording of the AMSAT and behavioural cue statements in an iterative participatory process with midwifery academics, assessors and students. The tool was field-tested in different assessment environments in phase two. Completed assessment forms were statistically analyzed, whilst assessor surveys were analysed using descriptive statistics and qualitative content analysis.

Findings: Analysis of AMSAT (n=255) indicates the tool as: internally reliable (Cronbach alpha > 0.9); valid (eigenvalue of 16.6 explaining 67% of variance); and sensitive (score analysis indicating increased levels of proficiency with progressive student experience). Analysis of surveys (n=108) found acceptance of the tool for the purpose of summative and formative assessment, and in the provision of feedback to midwifery students on their performance.

Conclusion: This study demonstrates that the re-developed AMSAT is a valid, reliable and acceptable tool to assess midwifery students' performance against the Australian Midwife Standards for Practice

This user-friendly tool can be used to standardize midwifery student assessment in Australia and enable continued benchmarking across education programs.

Statement of significance

Problem or Issue

The first Australian Midwifery Standards Assessment Tool (AMSAT) to assess competence in midwifery students was developed against the Competency Standards for the Midwife (2006). In 2018, the new Midwife Standards for Practice superseded the competencies, requiring a revision of AMSAT.

What is Already Known

Midwifery is a regulated profession that requires each midwife to demonstrate requisite standards. Successful midwifery registration is reliant on the quality use of robust assessment tools.

What this Paper Adds

Evidence that the AMSAT is a valid and acceptable tool to assess midwifery students' performance to meet the Australian Midwife Standards for Practice across diverse settings; and that it is sensitive to difference between formative and summative assessment.

Keywords

Clinical assessment, midwifery education, validation, competence, professional standards, practice-based learning

Introduction

Health profession students need to be appropriately prepared to practice upon graduation. Authentic learning, assisted through formative and summative assessment throughout their program[1] is important for student preparation for practice. Furthermore, assessment of student learning in the practice setting is critical in the safeguarding of minimum professional practice standards and achievement of quality health and safety standards. Lack of clear expectations regarding assessment of midwifery student performance and attributes has been identified as an area of concern.[2,3] Clinical assessment of midwifery student performance should, therefore, be grounded in authentic interactions and rated by assessors using a fair, valid and reliable tool.[3-6]

Practice based assessment is complex and may contain elements of subjectivity even when based on valid criteria of performance in real clinical practice.[7] It is important that assessment tools are designed to assess the art and science of practice in addition to knowledge, skills and attitudes.[8,9] A holistic approach is required that integrates the assessment of performance that demonstrates a midwifery values-based approach, woman-centred care, clinical judgment, critical thinking and reflective practice.[2] Moreover, workplace performance assessment should occur over a continuum of time, in a process that values assessment as learning and fosters self-regulation and lifelong inquiry.[10]

The Nursing and Midwifery Board of Australia (NMBA) outlines the scope of practice of a midwife as dependent on "the context in which the midwife works, the health needs of women and their babies, the level of competence and confidence of the midwife and the policy requirements of the service provider."[11 p.8] Furthermore, competence is defined as "the possession of required skills, knowledge, education and capacity."[11 p.6] In order to fulfil an individual's full scope of practice in any given midwifery context, their level of performance against the practice standards must therefore be ascertained.

During the past few years, the "Australian regulatory environment in which midwives are registered, and programs of study accredited and delivered, have undergone significant change,"[12 p.1] requiring a

parallel reconsideration of practice evaluation processes. This paper describes the revalidation of the assessment instrument, the Australian Midwifery Standards Assessment Tool (AMSAT) piloted initially in a limited context and based on the Competency Standards for the Midwife. This revalidation is conducted in diverse settings across university placement sites and based on the NMBA's Midwife Standards for Practice.[11]

Background

Assurance of the standards of midwifery care provision is paramount for optimum outcomes for women and their families receiving midwifery services. The NMBA Midwifery Standards for Practice[11] guide curricula for the preparation of new graduates. The Board recently updated the midwifery standards (from competency standards to standards for practice) which has necessitated a review of curricula, including assessment that determine that the midwife is safe to practice. The NMBA defines standards for practice as "the expectations of the midwife's practice in all contexts".[11 p.8] These standards for practice link strongly to the International Confederation of Midwives (ICM) Essential Competencies for Midwifery Practice,[13] which outline the minimum set of knowledge, skills and professional behaviours required to register as a midwife.

Several nursing and midwifery assessment tools have been developed and tested for validity and reliability over the last few years.[3-6,14-16] However, many of these assess clinical skills, rather than comprehensively assessing students' professional performance. None of these directly address the Australian Midwifery Standards for Practice.[11] A systematic review of clinical assessment for undergraduate nursing students[17] highlighted the need for the development of a clinical assessment that is inclusive of the broad elements of professional practice and is valid and reliable. Wu et al.[17] noted that few studies provided statistical data and recommended testing validity of scale items using factor analysis. Several studies[15,18,19] have indicated that the assessment instrument must be both educationally informative and psychometrically sound if valid and reliable assessment of students is to be made. Furthermore, the importance of valid and reliable instruments is highlighted in current

national and international literature.[9,16,18,20] It is also important to have not only a validated tool, but also clearly articulated behaviour statements to promote consistency when interpreting the tool.[3,15] Behavioural cues are self-explanatory statements in plain language that describe observable episodes of performance.[3,21] The use of behavioural cues are recognised as providing clarity to the student and assessor during the assessment and communication process.[3,21] In Australia, the AMSAT has been developed to assess workplace performance.[3] The original version of AMSAT was developed against the National Competency Standards for the Midwife.[22] Following the validation process, it was found to be highly effective and user-friendly by both students and assessors.[3]

The development of a clinical assessment tool that determines the proficiency of students against a set of standards, helps overcome potential bias and subjectivity by assessors.[5,23] Fisher et al.[24] found that a reliable and valid assessment should evaluate midwifery student's professional performance against a set criterion rather than being judged by an individual. Standardising assessment processes with tools that align with professional standards, are important in reducing assessor variability.[25] The AMSAT tool assesses repeated performance against the expected standards of practice. This current study outlines the renewal of the AMSAT tool using the new Midwifery Standards for Practice.[11]

Aim

This study developed and validated an assessment tool that evaluates the performance of midwifery students against the Australian Midwife Standards for Practice (2018).[11]

Methods

Design

A mixed methods two phase approach was used. In Phase One the wording of the item statements and accompanying behavioural cues were collectively developed and agreed upon. In Phase Two the tool was field-tested, and a psychometric evaluation conducted. During field testing feedback about the utility and acceptability of the tool was collected via surveys from assessors using the tool. The

research team consisted of 11 academics from nine universities across three states and two territories of Australia.

Ethical considerations

Ethical approval was granted by each of the collaborating universities. Potential participants were provided with an information sheet that detailed all aspects of the study, including requirements of participation, potential benefits of the study to midwifery education, this was reiterated with a verbal explanation during workshops. Informed voluntary consent was assumed by the participants presence at a workshop, by completion of the AMSAT tool and survey, or by signed consent (some universities). All data collected were de-identified.

Phase One

The first step was to develop the tool wording against the new standards for practice. This involved iterative workshops with stakeholders and the research team. Prospective users of the tool, for example, academics, clinical facilitators, preceptors and current midwifery students from each institution were identified by local research team members and invited to attend a workshop. Participants' presence at the workshops was considered willingness and consent to participate. This consent process was reiterated verbally at the commencement of the workshops, and any persons unwilling to participate in the project were free to leave the collective discussion or choose not to actively participate in any aspect of the discussions.

A total of four workshops of one to two hours were conducted during the latter half of 2018. Two of the workshops occurred in university meeting rooms, one took place in a local restaurant afterhours, and one at an international conference at which many midwifery educators were gathered. There was a total of 66 participants in Phase one, including the research team. The purpose of the workshops was to undertake a mapping exercise to identify those areas of midwifery practice that were explicit in the standards that need review in the assessment process, and to discuss and debate the language,

wording and content of the final AMSAT assessment statements and behavioural cues, in an iterative participatory process. Field notes were taken at each of these workshops. Draft versions were successively emailed out to the research team and participants following each meeting with the suggested amendments to gain consensus.

The AMSAT tool has two sections. The first section (see Figure 1) includes student and placement identification items, followed by a series of 25 statements that address the seven practice standards, with which the student's performance is assessed on a five-level rating scale. There is a *'not applicable'* section for statements where the student has not had an opportunity to demonstrate the behaviour. The first section concludes with a global rating scale of overall performance. The second section (see Figure 2) has a feedback box, an assessment of English proficiency, areas for final verification, and the tools scoring rules. The following psychometric evaluation relates to the 25 assessment statements. This section of AMSAT should not be modified. The overall structure of the tool, the types and locations of the student, placement identification items and verification sections, and the feedback box can be modified to suit individual educational institutions. Furthermore, the tool can be used in hard copy or in a digital version. The related behavioural cues are shown in Figure 3.

AMSAT – Australian Midwifery Standards Assessment Tool

				Unsatisfactory	Limited	Satisfactory	Proficient	Excellent	Not Assessed
Student Name		**Student ID**							
Course Code		**Year Level**							
Clinical Setting		**Placement Duration**							
Assessment Type	**Formative:** ❑ **Summative:** ❑ Pass/❑ Fail	**Date**							
Assessment Items – circle one performance level for each item									
Standard 1: Promotes health and wellbeing through evidence-based midwifery practice									
Works in partnership with the woman to identify what is important to her, inform decision making, and promote self-determination				1	2	**3**	4	5	N/A
Sources, critically evaluates and reflects on relevant evidence to inform safe, quality practice				1	2	**3**	4	5	N/A
Applies primary health care principles to address individual, community, and public health issues				1	2	**3**	4	5	N/A
Promotes equitable access to appropriate midwifery care				1	2	**3**	4	5	N/A
Demonstrates ability to initiate health education and provide resources to enable women to influence their own health outcomes				1	2	**3**	4	5	N/A
Standard 2: Engages in professional relationships and respectful partnerships									
Participates as an active member of the healthcare team to promote optimum health outcomes				1	2	**3**	4	5	N/A
Demonstrates knowledge and understanding of the principles of cultural safety and provides culturally responsive woman-centered care				1	2	**3**	4	5	N/A
Practises in a way that respects that family and community underpin the health of Aboriginal and/or Torres Strait Islander women and their families				1	2	**3**	4	5	N/A
Acknowledges and manages personal values, beliefs, and power dynamics in midwifery to ensure equity, justice, non-judgmental, and non-discriminatory practice				1	2	**3**	4	5	N/A
Practices within professional boundaries and demonstrates ethical conduct to ensure rights, privacy, and confidentiality				1	2	**3**	4	5	N/A
Standard 3: Demonstrates the capability and accountability for midwifery practice									
Recognises and practices within own midwifery scope, professional standards, relevant legislation, and local policy				1	2	**3**	4	5	N/A
Demonstrates knowledge and accountability for own midwifery practice				1	2	**3**	4	5	N/A
Consults, refers, documents appropriately and manages complexity in a timely manner to provide safe, quality care				1	2	**3**	4	5	N/A
Demonstrates commitment to life-long learning of self and others				1	2	**3**	4	5	N/A
Recognises and responds appropriately when own, or others', quality/capability for practice is impaired				1	2	**3**	4	5	N/A
Standard 4: Undertakes comprehensive assessments									
Completes comprehensive and systematic assessments using appropriate and available resources, and accurately documents findings				1	2	**3**	4	5	N/A
Critically analyses and interprets assessment data to inform and improve midwifery practice in partnership with the woman				1	2	**3**	4	5	N/A
Accurately assesses the physical, social, emotional, cultural and spiritual needs of women, communities, and populations				1	2	**3**	4	5	N/A
Standard 5: Develops a plan for midwifery practice									
Collaboratively plans appropriate woman-centred care based on assessment findings to achieve optimal outcomes				1	2	**3**	4	5	N/A
Identifies and accesses appropriate resources, including relevant health professionals or services, for planning woman-centred care				1	2	**3**	4	5	N/A
Appropriately reviews and modifies planned care in partnership with the woman, and documents to facilitate optimal outcomes				1	2	**3**	4	5	N/A
Standard 6: Provides safety and quality in midwifery practice									
Recognises and acts on identifying emergency/urgent or unsafe situations, and initiates appropriate actions to meet optimal outcomes				1	2	**3**	4	5	N/A
Works collaboratively as an effective team member by supporting, reflecting on, and incorporating feedback to improve midwifery practice				1	2	**3**	4	5	N/A
Standard 7: Evaluates outcomes to improve midwifery practice									
Evaluates, monitors, and reflects on practice and responds to feedback for continuing professional development to enable optimal outcomes for women and families				1	2	**3**	4	5	N/A
Develops, implements, reviews, and reflects on personal learning goals for professional growth and development				1	2	**3**	4	5	N/A

GLOBAL RATING SCALE - *relative to their stage of practice*, **the overall performance of this student in the clinical unit was:**

Unsatisfactory ❑	Limited ❑	Satisfactory ❑	Proficient ❑	Excellent ❑

Feedback	
How have previous learning goals been addressed?	
What was done well?	
What needs to be improved?	
Plan for learning and time frames for achievement	

Spoken English proficiency: ❑ unsatisfactory   ❑ needs development   ❑ satisfactory

DISCUSSED: ❑ YES ❑ NO	**ADDITIONAL PAPERWORK:** ❑ YES ❑ NO

DATE: _____

ASSESSOR'S NAME: _____

ASSESSOR'S SIGNATURE: _____

STUDENT SIGNATURE: _____

Scoring Rules and Code

- Circle N/A (not assessed) ONLY if the student has not had an opportunity to demonstrate the behaviour
- Evaluate the student's performance against the MINIMUM competency level expected for their level of training

Expected behaviours and practices:
1 = not performed; direct close guidance and immediate feedback required
2 = inconsistent or below acceptable standard; continuous cues required, meaning of cues explored and clarified with student
3 = consistently performed at a satisfactory/pass level; frequent cues required, cues developed in partnership with student
4 = performed at a proficient standard; occasional cues required, based on student's learning goals
5 = performed at an excellent standard; minimal cues required, based on student's aspirations
N/A = not assessed.
**Note: a rating 1 or 2 indicates that the competency statement has NOT been achieved
More information available at: www.amsat.com.au

Standard 1: Promotes health and wellbeing through evidence-based midwifery practice

Works in partnership with the woman to identify what is important to her, inform decision making, and promote self-determination

- Introduces self and develops rapport with woman and family
- Actively listens to and is sensitive to the views of the woman and her family
- Shares information with the woman to facilitate informed decision making
- Uses appropriate and meaningful language in all communications
- Is respectful to the woman and her family

Sources, critically evaluates and reflects on relevant evidence to inform safe, quality practice

- Locates and uses best evidence to guide practice (e.g. clinical practice guidelines, systematic reviews, databases, texts)
- Able to interpret evidence to guide practice
- Clarifies understanding and application of evidence with colleagues
- Applies clinical practice guidelines and policies to care

Applies primary health care principles to address individual, community, and public health issues

- Educates women and family on public health issues (e.g. immunization)
- Provides health promotion and illness prevention midwifery practice
- Practices evidence-based initiatives (e.g. BFHI, quit smoking, recreational drugs and alcohol minimisation, safe sleeping, raising kids network)
- Protects, promotes and supports breastfeeding

Promotes equitable access to appropriate midwifery care

- Defines and promotes midwifery continuity of care and its benefits
- Seeks to provide continuity of care for all women
- Informs women about and refers to relevant services (e.g. social worker, ABA)
- Advocates for women to receive the health care required

Demonstrates ability to initiate health education and provide resources to enable women to influence their own health outcomes

- Uses a range of learning strategies to inform women about health choices
- Locates and uses appropriate health education materials
- Seeks feedback from the woman to ascertain her understanding of health information

Standard 2: Engages in professional relationships and respectful partnerships

Participates as an active member of the healthcare team to promote optimum health outcomes

- Works collaboratively with all members of the health care team
- Creates positive and productive working relationships with colleagues
- Keeps supervising midwife informed of care and asks for help when needed
- Uses knowledge of other health care team roles to develop collegial networks

Demonstrates knowledge and understanding of the principles of cultural safety and provides culturally responsive woman-centered care

- Identifies cultural origin of the woman and family
- Respects and accommodates cultural differences of the woman and family
- Demonstrates cultural sensitivity across a range of contexts
- Ensures culturally specific needs are met, e.g. dietary
- Uses interpreting services when necessary

Practises in a way that respects that family and community underpin the health of Aboriginal and/or Torres Strait Islander women and their families

- Involves family/others appropriately to ensure cultural/spiritual needs are met
- Accommodates the role of family in A&TSI decision making
- Collaborates with Indigenous health workers to optimise woman's experience and outcomes.
- Facilitates strategies to address culturally specific care needs are met

Acknowledges and manages personal values, beliefs, and power dynamics in midwifery to ensure equity, justice, non-judgmental, and non-discriminatory practice

- Practices in a non-judgmental way for all women and families
- Recognises and manages own attitudes and potential power imbalances
- Acknowledges potential impact of own views on woman and family
- Supports and assists with the woman's choice of care for self and baby
- Uses strengths-based language which encourages the woman and builds confidence in her own abilities

Practices within professional boundaries and demonstrates ethical conduct to ensure rights, privacy, and confidentiality

- Maintains professional boundaries with woman and colleagues
- Ensures privacy and confidentiality at all times including in the use of social media
- Provides dignity and respect for all woman taking individual preferences into consideration
- Appropriately concludes relationships with woman and family

Standard 3: Demonstrates the capability and accountability for midwifery practice

Recognises and practices within own midwifery scope, professional standards, relevant legislation, and local policy

- Declares own limitations
- Recognises and actively seeks collaboration or referral with other health professionals when outside of own scope of practice
- Practices under appropriate supervision
- Follows policies and procedures of the health service (e.g. practice guidelines, workplace health and safety, and infection control)
- Demonstrates knowledge of legal frameworks
- Practices according to ethical and professional standards (e.g. Code of Ethics, Code of Professional Conduct)

Demonstrates knowledge and accountability for own midwifery practice

- Has appropriate knowledge base for level of practice
- Advises appropriate persons and in good time of absence from placement
- Arrives punctually, and is fit to practice
- Wears appropriate uniform, identification and personal protective equipment when necessary
- Organises self to provide effective care
- Writes contemporaneous notes, that are legible and include date, time, author and designation, and have these reviewed and countersigned
- Demonstrates safe medication management

Consults, refers, documents appropriately and manages complexity in a timely manner to provide safe, quality care

- Uses decision framework tools to guide practice
- Explores woman's/baby's history to identify potential for risk
- Uses subjective and objective data to identify risk and complexity, and make appropriate referrals and provide care
- Responds effectively to rapidly changing situations
- Applies the Australian College of Midwives Guidelines for Consultation and Referral

Demonstrates commitment to life-long learning of self and others

- Reflects on experiences to identify learning needs to advance knowledge and practice

- Maintains a record of learning in accordance with educational requirements
- Is proactive in seeking out and engaging with learning opportunities
- Engages as part of the team and attends workplace-based education sessions
- Keeps supervising midwife informed of own scope of practice and learning objectives

Recognises and responds appropriately when own, or others', quality/capability for practice is impaired

- Adheres to the NMBA requirements where there are concerns about own or others ability to safely practice
- Recognises and reports to supervisor deviations from safe and quality care
- Takes leave of absence when unwell or unfit to practice
- Seeks guidance and assistance when care needs are outside own capability
- Aware of own limitations and communicates this responsibly

Standard 4: Undertakes comprehensive assessments

Completes comprehensive and systematic assessments using appropriate and available resources, and accurately documents findings

- Uses effective questioning techniques to gain required information (e.g. smoking status, social support and cultural preferences)
- Explains to the woman the purpose, nature and extent of the assessments to be performed
- Explains screening procedures and their rationale (e.g. HIV, EPNDS, Domestic Violence, NNST)
- Identifies health literacy issues and takes action when communicating with women
- Correctly uses assessment tools and equipment (e.g. MEOWS, EPNDS, CTG)

Critically analyses and interprets assessment data to inform and improve midwifery practice in partnership with the woman

- Follows up and interprets results of all investigations, and prioritises findings
- Documents and reports assessment findings
- Performs a comprehensive handover using ISBAR
- Informs the woman of the assessment outcome in suitable language avoiding jargon (e.g. blood tests)
- Responds to woman's questions or cues with knowledge and sensitivity

Accurately assesses the physical, social, emotional, cultural and spiritual needs of women, communities, and populations

- Modifies assessment practice in response to the individual situation (e.g. normal or complex episode, primipara or multipara, complex social situations, perinatal mental health)
- Sensitively engages with the woman and family experiencing significant stressful event (e.g. fetal anomaly or bereavement)
- Consults with the woman and health care team about care needs and appropriate resources

Standard 5: Develops a plan for midwifery practice

Collaboratively plans appropriate woman-centred care based on assessment findings to achieve optimal outcomes

- Actively engages the woman and her family to formulate an achievable plan of care
- Advocates for the woman through encouragement to be an active participant in the health care of herself and her baby
- Interacts with members of the health care team, in a collaborative and respectful way
- Uses a variety of methods to communicate with other professionals (e.g. written, verbal, digital)

Identifies and accesses appropriate resources, including relevant health professionals or services, for planning woman-centred care

- Applies knowledge of physiology and pathophysiology to interpret data from the history, assessment, and investigations to inform care planning
- Uses information gathered to prioritise midwifery care including escalation of care, discharge procedures etc.
- Engages with community supports and agencies relevant to care needs
- Documents planned care for the woman and baby (e.g. on the woman's health record, in clinical notes, on pathways and in discharge documentation)
- Clearly and accurately communicates relevant and timely information about the woman to colleagues to inform planning

Appropriately reviews and modifies planned care in partnership with the woman, and documents to facilitate optimal outcomes

- Monitors the course of planned care and modifies where necessary in consultation with the woman and colleagues
- Documents and reports concern of anything compromising the health and safety of the woman receiving care
- Uses evidence-based care pathways and tools (e.g. ISBAR and MEOWS)

Standard 6: Provides safety and quality in midwifery practice

Recognises and acts on identifying emergency/urgent or unsafe situations, and initiates appropriate actions to meet optimal outcomes

- Provide clear and timely communication in times of distress
- Recognises situations in which the clinical needs of the woman are outside own scope of practice
- Collaborates with others to escalate care when complications are recognised (e.g. abnormal vital signs, PPH, DVT, mental health concerns, signs of sepsis)
- Follows local processes and procedures to escalate care when required
- Always maintains occupational health and safety (e.g. sharps management, PPE)
- Undertakes risk report of adverse outcomes

Works collaboratively as an effective team member by supporting, reflecting on, and incorporating feedback to improve midwifery practice

- Uses effective and appropriate communication (e.g. ISBAR) when communicating with team members
- Acts with integrity and in the best interests of women when making referrals, and when providing or arranging treatment or care
- Able to undertake tasks and participate in decision-making as directed
- Assists with data collection where appropriate (e.g. research initiatives, birth outcome audits and breastfeeding statistics) to improve midwifery care
- Acts to eliminate occupational violence including victimisation and bullying

Standard 7: Evaluates outcomes to improve midwifery practice

Evaluates, monitors, and reflects on practice and responds to feedback for continuing professional development to enable optimal outcomes for women and families

- Reviews care outcomes to ensure effective midwifery care
- Actively seeks feedback and incorporates formal and informal feedback from colleagues into their practice
- Can synthesise plans for, and actions in, clinical practice with evidence, woman's needs and feedback

Develops, implements, reviews, and reflects on personal learning goals for professional growth and development

- Sets personal learning goals for each shift/week and is proactive in achieving them
- Can reflect upon feedback and devise strategies for development of knowledge and skills

Phase Two was designed to determine the validity, utility and usability of the renewed AMSAT (Phase One). Adequate sample size was determined as ten completed assessment tools for each of the 25 statements, therefore we required 250 completed AMSAT forms.

Clinical facilitators and preceptors from six participating universities were approached by email by members of the research team and invited to participate. The data collection material included the AMSAT and a survey comprising eleven questions that asked about the utility and acceptability of the AMSAT. Clinical facilitators and preceptors were asked to undertake their regular assessment of students' clinical performances using the current university assessment form (as required by their course accreditation) and then complete the AMSAT that was being piloted from the same assessment episode. Assessors were then invited to answer nine Likert scale questions (on a five-point scale) regarding the utility of the AMSAT tool, and complete two open text questions for feedback and suggestions for improvement. The current university assessment forms were not collected for the purposes of the research. Only the de-identified AMSAT tool and survey were collected and analysed. Once completed, each assessor returned the forms to the research team.

Data analysis

AMSAT data was entered into SPSS V25 for analysis. The data was checked for independence, sample size, normality, linearity, and multicollinearity.[26] Principal Components Analysis (PCA) was run to verify how many components comprised the AMSAT, which are the qualities the tool measured and how many factors explained the variance in the data.[26] As a part of this analysis, a Kaiser-Meyer-Olkin measure of sampling adequacy, a Bartlett's test of sphericity, and a scree plot was used to verify that the data is suitable for factor analysis.[26] Communalities and eigenvalues were established for all possible factors, along with a factor matrix to establish factor loading values, and parallel analysis[27] to determine which of the identified factors would be retained. An inter-item correlation matrix was examined to establish strength and relationship of all possible pairs.[26] A Cronbach's alpha was

calculated to establish internal consistency and reliability of the total instrument and each individual domain.[26] Construct validity using known group testing was applied to establish instrument sensitivity for assessment type and year level. For the analysis of differences among groups in performance of the AMSAT tool for formative and summative assessment, ANOVA was chosen.[26] For skewed data, a Kruskal–Wallis test was used and follow-up analysis of effect size, the Cohen's f statistic, was calculated using a chi-squared test.[28] Due to the small number of Graduate Diploma (n=11) and the Registered Nurse entry (n=2) cases, these two groups were removed from only the ANOVA analysis.

The eleven-question survey consisted of a combination of nine numerical Likert responses and two open text responses. The Likert responses were analysed with simple descriptive statistics including means and standard deviations, while the qualitative responses were uploaded into NVivo where a content analysis was performed. Content analysis is a systematic and objective means of describing and quantifying qualitative data.[29] An inductive approach including open coding, to create categories and abstraction was used.[29] NVivo 12 was used in the qualitative analysis process.

Findings

A total of 255 AMSATs and 108 survey forms were collected from six Australian university midwifery programs. In the AMSAT forms, there were 6305 completed data points and 70 missing data points (empty fields). In Australia, students without any prior health professional registration enter through a Bachelor of Midwifery, while students with registration as a registered nurse may enter a Bachelor of Midwifery, Graduate Diploma or Masters level program. The AMSAT asks the students' year level and where provided, this is shown in Table 1.

Table 1: Frequency of AMSAT across entry pathways and year levels

			Frequency	Percent	Valid Percent	Cumulative Percent
Year Level						
Valid	BMid (non-RN) First Year		40	15.7	16.5	16.5
	BMid (non-RN) Second Year		134	52.5	55.1	71.6
	BMid (non-RN) Third Year		56	22.0	23.0	94.7
	Grad Dip		11	4.3	4.5	99.2
	RN entry		2	.8	.8	100.0
	Total		243	95.3	100.0	
Missing	System		12	4.7		
Total			255	100.0		

BMid = Bachelor of Midwifery; RN = registered nurse; Grad Dip = Graduate Diploma

Validation of the AMSAT Tool

Principal Components Analysis was conducted on the AMSAT Tool using the 6305 points of data collected from 255 participants, with the answers from 25 questions grouped within 7 standards to assesses midwifery practice. The Kaiser-Meyer-Olkin measure of sampling adequacy value was .879 and Bartlett's test of sphericity was significant (p< 0.000), both indicating that the data was suitable for factor analysis. One factor had an eigenvalue of 16.6 and explained about 67% of variance. A scree plot shows this (Figure 4). Table 2 shows the communalities matrix and shows good proportions of variance in each item that are accounted for by the one factor.
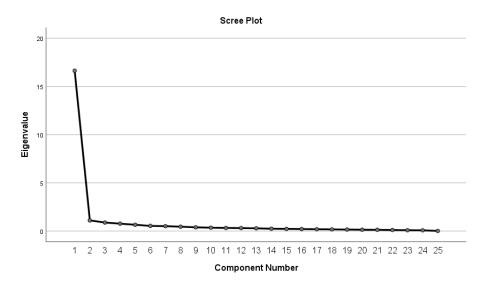
Figure 4: Scree plot – Factor analysis

Table 2: Communalities matrix

Communalities

	Initial	Extraction
Standard 1a	1.000	.633
Standard 1b	1.000	.651
Standard 1c	1.000	.792
Standard 1d	1.000	.734
Standard 1e	1.000	.662
Standard 2a	1.000	.731
Standard 2b	1.000	.791
Standard 2c	1.000	.840
Standard 2d	1.000	.807
Standard 2e	1.000	.628
Standard 3a	1.000	.638
Standard 3b	1.000	.745
Standard 3c	1.000	.682
Standard 3d	1.000	.724
Standard 3e	1.000	.645
Standard 4a	1.000	.683
Standard 4b	1.000	.747
Standard 4c	1.000	.705
Standard 5a	1.000	.701
Standard 5b	1.000	.729
Standard 5c	1.000	.757
Standard 6a	1.000	.587
Standard 6b	1.000	.744
Standard 7a	1.000	.708
Standard 7b	1.000	.672

Reliability of the AMSAT Tool

The Cronbach's alpha for the AMSAT Tool was found to be .986. This indicates excellent internal consistency and construct reliability. The Inter-Item Correlation Matrix showed values across individual items ranging from .506 to .891, with an average value of .742. If any of the 25 questions were to be removed from the analysis, the Cronbach's alpha would remain above .985, with almost no change to variance or scale mean. Thus, no changes were required and all 25 questions on the AMSAT were retained.

Construct Validity Using Known Group Testing

The Kruskal-Wallis One-Way ANOVA showed there was a statistically significant difference in the calculated mean scores of AMSAT performance for formative assessment (*Mean Rank* = 69.39) and summative assessment (*Mean Rank* = 96.44), *H* = 13.341, *df* = 1, *N* = 163, Cohen's *f* = .30 (medium effect size). When examining each individual standard in the AMSAT, similar significant differences and medium effect sizes were found for each standard, with summative assessments consistently rated higher than formative assessments. The values for differences in assessment type are given in Table 3.

Table 3: Values found for Assessment Type

	Overall	Standard 1	Standard 2	Standard 3	Standard 4	Standard 5	Standard 6	Standard 7
Kruskal-Wallis *H*	13.341	19.714	6.189	10.561	11.328	9.911	5.002	9.368
Respondents (N)	163	163	162	162	161	162	160	159
Cohen's *f*	0.30	0.37	0.20	0.26	0.28	0.26	0.18	0.25
Effect size	medium	medium	medium	medium	medium	medium	medium	medium

Year Level and the AMSAT Tool

There was a statistically significant difference in the calculated mean scores by year level: first year students (*Mean Rank* = 63.70), second year students (*Mean Rank* = 119.08), and third year students (*Mean Rank* = 143.93), *H* = 34.876, *df* = 2, *N* = 230, Cohen's *f* = .42 (large effect size). When examining

each individual standard in the AMSAT, similar significant differences and large/medium effect sizes were found for each standard, with third year students consistently scoring higher than second year students, who in turn consistently scored higher than first year students. The values for year level are given in Table 4.

Table 4: Values found for Year Level

	Overall	Standard 1	Standard 2	Standard 3	Standard 4	Standard 5	Standard 6	Standard 7
Kruskal-Wallis H	34.876	31.108	20.068	28.581	40.062	40.264	30.277	17.954
Respondents (N)	230	230	229	229	228	228	223	221
Cohen's f	0.42	0.40	0.31	0.38	0.46	0.46	0.40	0.30
Effect size	large	medium	medium	medium	large	large	large	medium

Survey results

Some assessors provided one survey form after completing multiple AMSAT tools, with the comments reflective of their collective experience. All nine Likert scale questions had a mean of 4.1, a range from 2 to 5 and SD .785 (see Table 5). There was a small number of wording change suggestions which have been incorporated into the behavioral cues, such as when referring to professional boundaries *"it would be good to say expectations/behaviour" (s5)*.

Table 5: AMSAT evaluation survey statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Question 1	108	2	5	4.10	.785
Question 2	108	2	5	4.10	.785
Question 3	108	2	5	4.10	.785
Question 4	108	2	5	4.10	.785
Question 5	108	2	5	4.10	.785
Question 6	108	2	5	4.10	.785
Question 7	108	2	5	4.10	.785
Question 8	108	2	5	4.10	.785
Question 9	108	2	5	4.10	.785
Valid N (listwise)	108				

Overall, the evaluation feedback of the AMSAT as an assessment tool was highly commended. One respondent said, *"It flows well, each standard connects to the previous one" (s10)*. Another explained, *"It is comprehensive and includes all areas of a student's practice - partnership, professionalism, accountability, critical thinking, safety of midwifery care and reflective practice" (s85).* Another said, *"easier to make assessments than the original AMSAT tool - better practical/relevant wording" (s63).* There was concern that *"the standards are repetitive" (s98)* however AMSAT cannot amend the standards, just address ways to assess them. Concern was raised by a few respondents about its value across the year levels. One respondent said, *"Tool is 'too wordy' and difficult to interpret for a 1st year student, resulting in many n/a" (s25),* whilst another said, *"This tool is certainly easier to complete assessing a 3rd year" (s20).* One respondent raised concern that marking a first-year student as *"limited"* is potentially unfair as they have limited capacity to perform the full scope of practice (s46). These quotes demonstrate a lack of awareness with the scoring rules which state that performance should be assessed against the expectations for the students' level of training, and that *'not applicable'* can be used when if the student has not had an opportunity to demonstrate the behaviour. The overall value of the tool discriminating across ranges of performance was captured in the following response. *"This is a wonderful tool when a student has breached her scope of practice as it shows the error but also acknowledges the areas where she has excelled" (s82).* Finally, one respondent concluded *"This tool is very good to use on the senior student, it captures their professional readiness for registration" (s6).*

Eight respondents raised concerns about the absence of a focus on individual skills. Three respondents commented on the difference between current CAT tools and AMSAT, as well as grading scales. One respondent felt *"this tool is much easier to use than the current CAT tool" (s56),* while another felt *"will be good to align the CAT tools with this tool as it is very generic" (s43)*. One respondent said, *"This tool graded the student differently to the Bondy scale and seemed more accurate" (s35).* (Note: the Bondy scale is a five-point rating scale that rates the level of assistance required, AMSAT uses a five-point developmental anchor scale based on holistic performance).[3]

The efficiency of completing the tool raised mixed comments with four respondents claiming it to be time consuming and four respondents claiming it to be quick and efficient. It was recognised, however, that *"once learned it will be fine"* (s43). The concerns about being time consuming were linked with comments about providing feedback on the back page.

Several suggestions for change to the back page of the tool were offered. One respondent wrote "*I like that communication is addressed" (s4),* whilst another suggested that *"on back page you could add question about proficiency of written English also"* (s16). One respondent recommended to *"make sure students' names are on the feedback form (side). As well as ID no. & date/placement etc." (s66).* The labels on the feedback sections raised a few concerns. One respondent said, *"plan for learning box - student driven, not necessary for summative assessment" (s24)*. Four respondents recommended removal of the word "*previous*" from the feedback box as they were unclear if it meant from last placement, and if so, felt it not relevant for first placement students. A suggested change was *"How have learning goals been addressed" (s46)*. One respondent asked, *"will the feedback section have columns for student/assessor?" (s10)*. Whilst another commented, *"The student commented that there was nowhere for her reflection/comments and wanted the opportunity, particularly for summative assessment" (s55).*

The inclusion of behavioural cues was considered important for the use of AMSAT. One respondent said, *"It is essential that the tool is used in conjunction with the behavioural cues" (s72)*. Another explained that *"Behavioural cues will naturally help to expand on my understanding of the AMSAT" (s10)*. And, *"I think the behavioural cues definitely help with completing the tool" (s99)*. A few respondents made comment that they looked forward to the associated cues, which were not available at the time they contributed to the data collection.

Discussion

This study demonstrates that the re-developed AMSAT is a valid and acceptable tool to assess midwifery students' performance to meet the NMBA Midwife Standards for Practice.[11] Specifically this tool was developed to assess students' professional performance for midwifery practice and has been shown to be reliable, versatile and easy to use. This is important as a review of the literature on clinical assessment of midwifery students has revealed a lack of current, reliable and validated tools used to determine the proficiency of students against a set of standards.[17] Analysis of the 255 completed AMSAT showed the tool to be sensitive to changes in performance across formative and summative assessments. Because the aim of formative assessment is assessment for learning,[30] it is expected that scores on summative assessment would have improved from the formative due to the student's ability to act upon feedback provided.

The AMSAT has been designed to measure the midwifery students' ability to perform commensurate with their year level within the course. It follows then that there may not necessarily be any progression in score as the year level increases. However, this study has shown that students in third year scored higher than students in second year, and those in second year score higher than those in first year. This is consistent with the previous AMSAT tool which assessed student performance against the NMBA National Competency Standards for the Midwife.[3] This phenomenon could be explained through increasing experience where more experienced students typically exhibit greater confidence than less experienced students.[31] Therefore, the tool measures the expected progression of capability in students.

Midwifery is a profession underpinned by critical thinking and clinical reasoning to inform professional practice as defined by the NMBA Midwife Standards for Practice.[11] Therefore, any tool designed to assess midwifery students' abilities in practice should conduct a comprehensive assessment of performance, rather than focus on assessing tasks or skills. Global assessment ratings used in the AMSAT tool are shown to better enable the levels of expertise to be assessed and are appropriate to

use as the students' capacity increases.[19] Interestingly, comments from assessors support this assertion where the view was that the tool is easier to use to assess more experienced students.

This study demonstrates the tool reliably captures student performance and has been designed to address the question of variability among assessors. Like the Australian Nursing Standards Assessment Tool (ANSAT), the design of the AMSAT enables a benchmarking process to occur. Benchmarking is a way to compare assessment outcomes between assessors and has been shown to be useful in identifying variations and targeting areas where there are significant for discussion to reduce assessor variability.[32]

Feedback from the assessor evaluation of the AMSAT describes the tool's usefulness and adaptability. Assessor feedback about the statements was mostly positive. The tool is easily adaptable to personalized electronic devices while the integrity of the standards statements is maintained. Most feedback from assessors concerned the areas available for comment and reflection. It is recommended that feedback boxes be modified to suit local need and consider space for student and assessor comment. Changes such as these can easily be localised to suit the specific educational institution or placement facility without impacting on the validity of the tool.

Limitations

The main limitation of the validation method was that it could not be validated in every educational setting. While the AMSAT has been validated to assess midwifery student's performance against a set of standards, it is optimistic to expect one tool to address all assessment needs across a broad spectrum of clinical placements, situations and individual circumstances. However, the combined partnership of academics across nine universities with data collection occurring at six universities, the effectiveness of the AMSAT has occurred in a variety of settings across Australia, enabling a good representation of student placement. This study sought to determine the validity and reliability of the AMSAT, and as such the number of individual assessors and their experience levels was not

determined. There was a low number of Graduate Diploma (n=11) and Registered Nurse entry (n=2) cases which were including in the primary analysis, however removed from the ANOVA analysis. Future validation processes should endeavour to gather data across all program types and consider assessor variances. The AMSAT lends itself to be adaptable with the back page able to be modified to meet local need or preference.

Conclusion

Our profession and community need competent and confident graduating midwives and it is in all our interests to ensure this is facilitated through constructive assessment. A research team of academics from nine universities across three states and two territories of Australia collaborated to renew and validate an assessment tool (AMSAT) for student midwives in Australia. The AMSAT identifies areas of midwifery practice that facilitates assessment of students' professional behaviours for midwifery practice. This study demonstrated that the re-developed AMSAT is a valid and acceptable tool to assess midwifery students' performance to meet the NMBA Midwife Standards for Practice.[11] Furthermore, this research has shown the AMSAT to be reliable, versatile, and easy to use for both students and assessors. This work is important as it fills the gap of the identified lack of current, reliable and validated tools used to determine the performance of midwifery students against a set of standards. The AMSAT is applicable to educational settings in Australia.

Moving forward, the next steps will be to disseminate, promote and implement the AMSAT into tertiary institutions and undertake benchmarking across programs. It will also be important to develop systems and mechanisms for ensuring the AMSAT remains valid over time and keeps pace with changes in professional standards and training needs.

Conflict of interest

None of the authors declare a conflict of interest.

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