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Development and validation of a written credentialing examination for overseas-educated dietitians

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Abstract

Aim Health professionals seeking employment in foreign countries are commonly required to undertake competency assessment in order to practice. The present study aims to outline the development and validation of a written examination for Dietetic Skills Recognition (DSR), to assess the knowledge, skills, capabilities and professional judgement of overseas-educated dietitians against the competency standards applied to dietetic graduates in Australia. **Methods** The present study reviews the design, rationale, validation and outcomes of a multiple choice question (MCQ) written examination for overseas-educated dietitians based on 5 years of administration. The validity of the exam is evaluated using Messick's validity framework, which focuses on five potential sources of validity evidence-content, internal structure, relationships with other variables, response process and consequences. The reference point for the exam pass mark or "cutscore" is the minimum standard required for safe practice. **Results** In total, 114 candidates have completed the MCQ examination at least once, with an overall pass rate of 52% on the first attempt. Pass rates are higher from countries where dietetic education more closely reflects the Australian model. While the pass rate for each exam tends to vary with each cohort, the cutscore has remained relatively stable over eight administrations. **Conclusions** The findings provide important data supporting the validity of the MCQ exam. A more complete evaluation of the validity of the exam must be sought within the context of the whole DSR program of assessment. The DSR written component may serve as a model for use of the MCQ format for dietetic and other professional credentialing organisations.

Keywords

dietitians, overseas-educated, examination, development, credentialing, validation, written

Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

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Review

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3

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6 to undertake competency assessment in order to practice. This study aims to outline the
7 development and validation of a written examination for Dietetic Skills Recognition (DSR),
8 to assess the knowledge, skills, capabilities and professional judgement of overseas-educated
9 dietitians against the competency standards applied to dietetic graduates in Australia.

10 **Methods:** This study reviews the design, rationale, validation and outcomes of a multiple-
11 choice (MCQ) written examination for overseas-educated dietitians, based on five years of
12 administration. The validity of the exam is evaluated using Messick's validity framework
13 which focuses on five potential sources of validity evidence – content, internal structure,
14 relationships with other variables, response process and consequences. The reference point
15 for the exam cutscore is the minimum standard required for safe practice.

16 **Results:** One hundred and fourteen candidates have completed the MCQ examination at least
17 once, with an overall pass rate of 52% on first attempt. Pass rates are higher from countries
18 where dietetic education more closely reflects the Australian model. While the pass rate for
19 each exam tends to vary with each cohort, the pass mark or 'cutscore' has remained relatively
20 stable over the eight administrations outlined in the paper.

21 **Conclusions:** The findings provide important data supporting the validity of the MCQ exam.
22 Fuller evaluation of the validity of the exam must be sought within the context of the whole
23 DSR programme of assessment. The DSR written component may serve as a model for use of
24 the MCQ format for dietetic and other professional credentialing organisations.

1

2 **Key words:** credentialing, professional competence, competency standards, multiple-choice
3 questions, standard setting, validity

4

5 **Introduction**

6 Credentialing is the processes by which health professional organisations verify the
7 qualifications and experience of practitioners in order to determine their ability to provide
8 safe, high quality health care services within a specific health care setting and role.¹ The
9 credential to practise as a dietitian in Australia is issued and monitored by the Dietitians
10 Association of Australia (DAA). DAA self-regulates the licensing or credentialing of
11 dietitians, governed under the Accredited Practising Dietitian (APD) credential. Dietitians
12 who are educated and qualified in other countries are required to undertake dietetic skills
13 credentialing, managed by DAA on behalf of the Australian Government's Department of
14 Immigration and Border Protection. This credentialing is a complex multi-stage process that
15 includes assessment of knowledge, skills, capabilities and professional judgement aligned
16 with the same competency standards² applied to dietetic graduates in Australia. The Dietetic
17 Skills Recognition (DSR) process for overseas educated dietitians involves three stages: (i)
18 assessment of qualifying degree and relevant experience, including currency of practice and
19 credentialing in country of origin (desktop review); (ii) completion of a written dietetic
20 examination, and (iii) an oral counselling interview examination. Candidates are given three
21 opportunities to pass each of the two examinations. Candidates who complete all three stages
22 of the DSR process are then eligible to apply for membership of the DAA and the APD
23 program. Passing the DSR written exam is a prerequisite for being able to attempt the oral
24 counselling interview examination.

25

1 During 2009 and 2010, the DAA undertook an extensive evaluation of the process for
2 credentialing overseas educated dietitians with particular focus on its validity, ability to
3 assess scope of practice, and cost-efficiency.³ The evaluation determined that while the
4 previous case-based short answer (SA) examination format was theoretically appropriate,
5 there were concerns with elements of the examination process, including the degree of
6 subjectivity in the marking of written responses, the limited scope of practice that could be
7 assessed, and the financial burden of conducting a case-based examination system. In
8 response, DAA considered the multiple choice question (MCQ) format as an alternative
9 format for the DSR written examination.

10

11 The use of MCQs for professional credentialing is now relatively common,⁴ including in the
12 health professional context, although some distrust about the format remains.⁵ Theoretically,
13 at least, the MCQ has several advantages as an assessment format, one of the most widely
14 acknowledged of which is its efficiency in terms of response; this not only facilitates the
15 examination of large numbers of candidates, but also allows excellent assessment coverage of
16 a professional domain.⁴ Such efficiency allows a relatively large number of items within the
17 designated testing time compared with other testing formats. Importantly, despite being
18 commonly referred to as 'objective tests', MCQs are actually only objectively *scored*, rather
19 than objectively developed. Just as much thought, discussion and debate must go into their
20 development as for any other assessment instrument used for high stakes purposes.^{4,6}

21 Research papers continue to emerge from various health professional contexts presenting data
22 which support the validity of using MCQs for credentialing purposes, and such validity
23 studies are important in helping shore up public confidence in the decisions made on the basis
24 of the results of MCQ examinations.⁷⁻¹²

25

1 Ideas about validity have also evolved, from being initially regarded as an inherent property
2 of a test to an *argument* for the particular interpretations and decisions based on the results of
3 the test.¹³ In earlier conceptualisations, the validity of a test tended to be sought in specific
4 and often isolated claims about the construct, content and criterion validity,¹⁴ with emphasis
5 frequently given to the latter (as ‘predictive validity’) in relation to subsequent real-life
6 performance. More recent approaches to validation of tests regard validity as a unitary
7 phenomenon and classify the *types* of validity evidence, rather than distinguishing between
8 different forms of validity.¹³ Accordingly, decisions made about credentialing test results are
9 more appropriately thought of as inferences requiring supporting evidence, rather than
10 unproblematic measures of professional competence.¹³

11
12 Two contemporary frameworks, developed respectively by Messick¹⁵ and Kane,^{16,17} reflect
13 this new thinking about validity. The former framework outlines five potential sources of
14 validity evidence (content, internal structure, relationships with other variables, response
15 process and consequences) while the latter focuses more explicitly on the type of validity
16 inference, namely, scoring, generalisation, extrapolation and implications. One of the effects
17 of reconceptualising validity in these ways is to play down the emphasis formerly invested in
18 predictive validity. While some relationship between achievement on an examination and
19 subsequent performance in a work context is clearly desirable, credentialing exams are not
20 primarily intended to predict individual performance in a specific job, but rather aim to
21 determine whether a candidate has acquired the (minimum) knowledge and understanding
22 necessary for competent performance,¹⁸ at least at the level represented by the pass mark.

23
24 It follows that validity can never be ‘proven’ as such,¹⁷ but rather consists of a deliberate and
25 continuous process of evidence gathering and justification for use and application in a given

1 context. Ultimately, validity discussions help explain how credentialing examinations reflect
2 a profession's conception of competence.¹⁹ This issue is fundamental to all credentialing
3 approaches (not only MCQs), and so the content and processes of credentialing must be
4 appropriately aligned with the scope of practice and standards of a profession.

5

6 This study aimed to describe the development and validity of the MCQ examination
7 administered in Australia to assess overseas educated dietitians for readiness to practice in
8 Australia.

9

10 **Methods**

11 The test development process, from the competency standards through to results, analysis and
12 candidate communication is represented in the flowchart in Appendix 1. We adopted
13 Messick's approach for organising and reporting on the development of the DSR MCQ
14 examination and the analysis of results. Ethics approval for this validation study was by
15 (blinded).

16

17 The content assessed by the DSR MCQ examination was determined by reference to the
18 National Competency Standards.² The MCQ exam blueprint is based on these Standards and
19 focuses on three common areas of dietetic practice – Food Service and Dietetics Management
20 (FSM), Community and Public Health Nutrition (CPH), and Individual Case Management
21 (ICM). The MCQs were developed to sample widely the knowledge, application and clinical
22 reasoning required of dietitians in these areas, equally represented on the exam. It should be
23 noted that while the DSR examination was originally based on the 2009 competency
24 standards, a recent review of the content against the updated 2015 standards determined that
25 few changes were necessary as questions already encompassed areas of professionalism,

1 communication, evidence based practice, improving nutrition outcomes and collaboration
2 critical to the new standards.²

3

4 Question writers were recruited from subject matter experts within each practice area.
5 Expressions of interest were sought from APDs with the appropriate dietetic expertise, as
6 well as experience in education and assessment of entry-level practitioners. Twelve APDs
7 were initially selected across the three areas, and experienced APDs were chosen to lead each
8 area and to form part of the Examination Committee (EC). An assessment expert and the
9 DAA Executive Manager for Accreditation also formed part of the EC. Training in this area
10 was conducted by one of the authors (blinded) via a two-day face-to-face workshop and was
11 structured around understanding and implementing key item writing principles, and the need
12 for and approach to peer review of questions.

13

14 This process produced an initial pool of 300 items. All drafted questions were reviewed by
15 fellow item writers in each area, as well as the area leads, to confirm the content and question
16 accuracy, and then further reviewed by the EC to confirm accuracy of content, alignment
17 with the competency standards, and appropriately targeting of generalist entry-level
18 dietitians. Ambiguous, contentious, inaccurate or unreasonably difficult questions were
19 similarly identified by the EC and removed from the question pool.

20

21 The response format was 120 MCQs to be completed in 150 minutes, comprising 40
22 questions for each area of practice. The MCQ item formats adopted were single best answer
23 and the extended matching format, as recommended by current handbooks of test
24 development.²⁰⁻²¹ In line with recommendations for professional competency assessments,
25 the majority of items included a 'stem' (also known as a 'scenario' or 'vignette') with

1 relevant clinical or contextual information, which candidates needed to read and understand
2 in order to respond meaningfully to the questions.⁴ The use of such a stem enabled the format
3 to assess higher levels of cognition beyond simply recall of isolated facts, such as application
4 of knowledge in different contexts and more integrated clinical reasoning.²²⁻²⁴ The items were
5 written so that the key should be identifiable as the best or most defensible option by
6 knowledgeable candidates. The incorrect options, referred to as 'distractors', were designed
7 to present plausible alternatives in the context of the material and question, but would be able
8 to be identified as incorrect by candidates with sufficient knowledge and understanding. To
9 further confirm the accuracy and suitability of questions in terms of assessed level of
10 competence and overall technical quality, questions were piloted with final year Australian
11 dietetics students from five Australian universities. Two-hundred and forty questions were
12 selected and administered to the volunteer students under standardised conditions (timed and
13 invigilated). Two hundred and ten students sat the pilot exam. Data from this pilot was
14 analysed (according to the examination processes and performance indicators described
15 further below) and the vast majority of questions (in excess of 90%) were deemed suitable to
16 form part of the initial exam question bank for assessment through the official DSR
17 assessment process.

18

19 The final selection of 120 questions for each examination was assembled by DAA
20 professional staff. Examinations were administered in approved computer exam laboratories
21 twice annually under strict invigilation and standardised conditions. Different versions of the
22 examination were developed for each administration, with some common items to maintain
23 appropriate blueprinting and to provide comparative data between administrations. Sample
24 questions were made available to candidates via the DAA website.²⁵

25

1 Following each administration, candidate scores and item statistics were reviewed to
2 ascertain the internal structure of the exam and analyse relationships with other variables.
3 Evidence relating to the internal structure was particularly sought in the reliability index and
4 in item quality indicators, namely the item facility (percentage of candidates correctly
5 answering each question) and the discrimination index (a measure of the consistency of
6 performance on an individual item with respect to the candidates' overall performance).²⁷⁻²⁸
7 A wide spread of item facilities is both expected, given the broad blueprint and different
8 complexity of clinical scenarios presented, and desirable, as it helps contribute to the
9 discrimination of the test.²⁷ It is important to note that differences in the overall difficulty of
10 tests do not necessarily undermine the fairness of the different exam forms, due to the
11 standardised standard setting procedure which was applied to ensure an equitable cutscore for
12 each exam (described below). The discrimination index (DI) provides information about the
13 validity of a question in terms of its relationship with other questions and the examination as
14 a whole, and is commonly calculated as a point-biserial correlation,²⁸ which is the method
15 adopted for this study. Good quality items which align with the overall blueprint and
16 appropriate domain are expected to have a positive DI; the threshold for acceptability is
17 commonly stated as 0.20, although slightly lower values are acceptable for tests which assess
18 different areas.²⁸ In addition, distractor analysis, an inspection of candidate selection patterns
19 on the distractors (incorrect options), is useful to help confirm that the distractors are inferior
20 to the designated key. In good quality items, the key should have a higher discrimination
21 value than the distractors, indicating that the high-performing candidates are less likely to
22 choose a distractor than lower performing candidates overall.²⁹
23
24 In accordance with our validity framework, we also sought to investigate the association
25 between performance on the DSR MCQ exam and other factors relevant to dietetic

1 competence. Data on subsequent performance of successful candidates in the DSR process
2 was not available to the EC, nor, as noted above, was the exam designed to necessarily
3 predict future performance. However, a key variable in performance, the country and
4 language of dietetic training of applicants, was available through the desktop review;
5 therefore, results were analysed according to regions by language and frequency.

6

7 The consequences of any test, according to Messick's validity framework, refers to its
8 impact, beneficial or harmful, intended or unintended.¹⁷ One of the most important of the
9 intended consequences is to set and confirm a defensible passing standard, that reflects fairly
10 and accurately the knowledge and understanding required by entry-level dietitians in
11 Australia, including overseas-educated. To achieve this, after each test administration, the EC
12 convened to determine the level of performance which represented the minimum acceptable
13 achievement on the exam, a process known in testing theory as 'standard setting'.
14 Traditionally, universities and other educational institutions have relied on a fixed and pre-
15 determined passing score; however, this does not account for potential variations in the
16 overall difficulty of examinations, which obviously affects how many test-takers will pass.
17 Accordingly, most credentialing organisations now set passing scores systematically and
18 empirically using one of many different methods as a way of gathering and comparing expert
19 judgements about acceptable performance on a particular test, and expressing that level of
20 performance as a single score on a test, known as the 'cutscore'.³⁰

21

22 For the DSR MCQ examination, a simplified version of the popular Angoff approach was
23 used, commonly known as the 'Yes/No' variant.³¹⁻³² In this method, subject matter experts
24 estimate the likelihood (in terms of 'likely' vs 'not likely') of a correct response from a
25 hypothesised borderline or minimally competent candidate, for each item on the exam, and

1 their collective judgements are converted into an overall percentage score based on the
2 number of 'yes' decisions, which represents the minimum acceptable level of performance.
3 Candidate scores are deemed acceptable if they meet or exceed the cutscore determined in
4 this way. Applying such a standard setting approach means that exams which differ in terms
5 of overall difficulty can be assigned comparable cutscores representing an equivalent level of
6 competence; as a result, candidates have similar chances of success on each exam, regardless
7 of the actual selection of items. Decisions made for any single item are carried over for
8 subsequent examinations, unless changes to the question (or dietetic practice) require the
9 standard to be re-set.

10

11 Following the determination of the cutscore for each test, candidates were notified of their
12 result and consequent eligibility to attempt the oral exam within six weeks of administration.
13 Successful candidates received notification only of their overall Pass result, while
14 unsuccessful candidates who failed based on substandard performance in a particular area
15 were alerted to their poor performance in that area. Feedback was also provided in the form
16 of reference to the National Competency Standards based on their performance. Unsuccessful
17 candidates could resit the MCQ examination on another two occasions.

18

19 Further validity evidence was obtained through calculation of a correlation coefficient (r-
20 value) to measure the association in performance between candidate mean performance, the
21 required cutscore to pass the MCQ examination, and the resulting candidate passing rate.

22

23 **Results**

24 The DSR MCQ exam was first administered in 2012. Up to the time of writing (August
25 2016), there have been 8 administrations at six-month intervals (Table 1). Candidate numbers

1 have been relatively stable over the eight administrations to date. One hundred and five
 2 overseas-educated candidates and nine Australian-educated candidates have completed the
 3 examination at least once. (Candidates from Australia were required to complete the
 4 examination due to limited currency of practice or disciplinary action, in order to be re-
 5 admitted into the APD program). Approximately half (52%) of all candidates passed on first
 6 attempt. Twenty of the first-time fails subsequently passed on second attempt, with two
 7 candidates passing on third attempt; three candidates have failed all three attempts (Table 1).

8

9 **Table 1** Descriptive statistics of all administrations across eight examination rounds and all candidates.^a

Administration Exam Number	1	2	3	4	5	6	7	8
Date of administration	Sep-12	Mar-13	Sep-13	Mar-14	Sep-14	Mar-15	Sep-15	Mar-16
No of questions	120	120	120	120	120	120	120	120
No of candidates ^a	20	18	23	16	10	10	21	19
No of repeat candidates	N/A	1	5	6	4	3	5	6
Mean candidate score (%)	67.2	63.8	70.3	66.7	65.3	70.8	66.9	71.3
Maximum total score (%)	76.7	72.5	80.0	73.3	73.3	81.7	79.2	85.0
Minimum total score (%)	52.5	41.7	51.7	52.5	47.5	60.0	47.5	50.8
Mean item facility (%)	66.2	64.3	70.9	67.0	63.6	70.8	70.6	74.8
Mean discrimination index	0.19	0.20	0.19	0.14	0.18	0.16	0.25	0.21
Reliability index ^b	0.72	0.81	0.77	0.63	0.77	0.69	0.85	0.80
Cutscore (%)	67	68	69	69	72	72	71	75
Pass rate (%)	70	39	61	56	30	63	52	68

10

11 ^a There are 114 unique candidates but this number includes candidates sitting repeat examinations (to a
 12 maximum of 3 attempts).

13 ^b Internal consistency calculated using the Quest programme²⁶

14

15

16 Despite different test forms and a majority of first time candidates for each administration,
 17 the overall difficulty of the examination has remained relatively stable, with the mean
 18 candidate score between 64% and 71% (Table 1 and Figure 1).

19

20

1 *Insert Figure 1 about here*

2

3

4 There has been a variable relationship between candidate performance and cutscore ($r = 0.46$)
5 (Figure 1), although the most recent increase in the cutscore was accompanied by a similar
6 increase in candidate pass rate.

7

8 The reliability of the test was above 0.70 for most administrations, with lower figures
9 recorded in March 2014 and March 2015. These lower values paralleled those of the mean
10 DI, suggesting that the items on those test forms were less coherent or homogeneous than the
11 other forms. These findings and how the EC dealt with them are discussed below.

12

13 The majority of candidates who trained in countries with English as the primary language of
14 instruction passed on first attempt, and achieved higher overall scores (and pass rates)
15 compared to candidates from non-English speaking backgrounds (NESB) (Table 2). Of these
16 candidates, only two passed on first attempt, six on second attempt and two on the third (and
17 final) attempt.

18

19 **Table 2** Demographics and pass rates of candidates by region of training.

Region of dietetics training ^a	No of Candidates	Total Passes (up to 3 attempts)	Overall pass rate (%)
English as first language of instruction ^b (overseas-trained)	73	60	82.2
Australia ^c	9	5	55.6
Europe (excluding UK/Ireland)	6	3	50.0
Asia/Subcontinent	14	4	28.6
South America	6	3	50.0
Middle East	6	4	66.7

1 ^a Note that individual country data is not reported due to the low numbers from some countries which may make some
2 candidates identifiable.

3 ^b Canada/USA/Ireland/South Africa/United Kingdom/New Zealand

4 ^c Australian candidates sitting for return to practice
5

6

7 Figure 2 shows that while the cutscore has remained relatively stable over the eight
8 administrations, the pass rate for each exam has varied considerably, pointing to a cohort
9 effect. The independence of these two indicators is confirmed by the correlation coefficient of
10 0.03.

11

12

13

Insert Figure 2 about here

14

15

16

17

18

19 Discussion

20 The methods and results reported above show that the DSR MCQ exam has been successfully
21 developed, piloted and administered over the period 2012–2016. The development processes
22 and the data collected through administration of the DSR examinations provide important

1 validity evidence consistent with Messick's framework focussing on test content, internal
2 structure, relationship with other variables, response process and consequences.

3

4 An initial question bank of 300 items across three key content areas of dietetic practice was
5 developed and judged by an expert panel to reflect appropriate entry-level dietetic
6 competence (with relevant updating and additional writing over time not reported here).

7 Candidate scores and item performance data are consistent with the purpose of the exam to
8 discriminate between different levels of knowledge by effectively assessing the foundational
9 content and application of knowledge of candidates. The growing bank of MCQ items
10 enables wide sampling of the areas of dietetic knowledge and the stem-based response format
11 allows assessment of higher order clinical reasoning. Individual item analysis points to the
12 majority of questions being of acceptable quality, while also highlighting any questions on
13 the examination which need to be rescored or removed from scoring. New questions for the
14 DSR MCQ examination continue to be developed and reviewed. Because of the
15 impracticality and potential security implications of using local dietetics students for ongoing
16 piloting of each item, this is achieved through the formal examination itself, where a small
17 number of new items are included in each administration and evaluated for quality, and
18 accepted for scoring only if shown to be psychometrically sound. In this way, a sustainable
19 bank of suitable items is continuously developed and benchmarked against the appropriate
20 level of candidature.

21

22 In terms of internal structure, the reliability of the examination, shows some variability across
23 administrations. Given the small candidate numbers for some administrations, demonstrated
24 variability of candidate knowledge, and the multi-stage nature of the assessment process, the
25 EC determined that a coefficient alpha index of 0.70 or above was acceptable for the

1 purposes and context of the DSR process, in line with many psychometric guidelines.³³
2 Although higher reliability indices (eg 0.90 or above) are sometimes advocated,^{27,34} this is
3 debatable when test content may be intentionally heterogeneous for blueprint purposes, as in
4 the DSR MCQ exam, since very high reliabilities may in fact indicate excessive redundancy
5 in test content.³³ However, the low reliability of the March 2014 exam prompted particular
6 review by the EC, and was attributed to a selection of items which had slightly lower
7 discrimination indices in comparison with previous years, as evidenced by the low mean DI
8 for that administration. In order to offset the greater error in measurement indicated by the
9 lower reliability, the EC lowered the cutscore for that administration by one standard error of
10 measurement (SEM), in accordance with common psychometric practice.³⁵ Nevertheless, the
11 lowered cutscore was still well above the next highest score, and therefore resulted in no
12 change to the pass rate. Subsequent item selection has since taken into consideration item
13 quality indicators more explicitly alongside content requirements, as borne out by subsequent
14 mean discrimination indices and reliability indices.

15

16 There appears to be a clear association between performance on the DSR MCQ examination
17 and English language competence, although this is also likely to be influenced by the quality
18 and scope of dietetic education and training available in the country of origin. It would be
19 expected that candidates from countries whose dietetics curricula are more aligned to those in
20 Australia will, in general, perform better in the exam, especially where the language of
21 instruction is also in English. This would seem to explain the lower rate of success for certain
22 groups of overseas-educated dietitians, particularly for candidates who have worked in
23 limited patient care settings in their countries of origin. While candidates have a range of
24 resources available to assist them to prepare for the exam via the DAA website, pass rates
25 will inevitably reflect the nature of contemporary dietetics practice as defined by the

1 Australian competency standards. This commitment to improving nutrition across multiple
2 practice settings in Australia is a strength of the preparation of dietitians and continues to be
3 recognised in a recent review of those standards.² Ongoing review of the relevance of the
4 MCQ items generally, but particularly in relation to new competency standards introduced in
5 2015,² is a current priority of the EC.

6
7 The main result (or ‘consequence’ in Messick’s terms) of the DSR MCQ examination is the
8 setting of an appropriate standard for the minimum knowledge and understanding necessary
9 to practice as a dietitian in Australia. The cutscore represented by this standard must
10 necessarily vary in accordance with the facilities of the individual items which make up any
11 version of the exam. However, the data shows that the cutscore has remained relatively stable
12 over the eight administrations. The same cannot be said for the pass rate for each exam,
13 which has varied considerably across administrations. This variation in pass rate for each
14 administration is not unexpected, given the difference in candidates who may sit a particular
15 administration. In the context of the relative stability of the cutscores and the standard setting
16 process, the variability in pass rate is most likely explained by candidate variability, rather
17 than differences in overall exam difficulty. The mean facility of the items on each
18 administration has been relatively stable, and the mean candidate score, related to the overall
19 difficulty of the examination, shows similar stability. The current cumulative pass rate of
20 52% on first attempt reflects a challenging examination which attempts to strike an
21 appropriate balance between protecting the public and professional standards, and fairness to
22 qualified candidates.

23

24 While candidates who fail to pass the MCQ examination are provided with feedback
25 regarding their performance and advised to seek mentoring, there are clearly several negative

1 consequences associated with failure in a credentialing exam, including disappointment,
2 frustration and anxiety, as well as the financial cost of having to re-attempt the exam. Such
3 consequences are arguably an inherent part of the credentialing exam process, but DAA
4 attempts to mitigate these to some extent through the possibility of re-attempts, the feedback
5 outlined above, and a formal appeal process for unsuccessful candidates. Nonetheless, the
6 need to better support and guide prospective candidates through the credentialing process is
7 highlighted in related literature, and acknowledged here.³⁶

8

9 It is important to reiterate that the written MCQ examination is only one part of the DSR
10 process of determining competence. While predicting subsequent performance of successful
11 candidates is not a primary purpose of credentialing exams, the authors nevertheless
12 acknowledge that a more complete validation of the DSR MCQ examination would include
13 consideration of workplace impacts of decisions based on the exam performance, including
14 success rates of APD applications. Given the examination has now been in use for over five
15 years, such data collection and analysis may now be feasible.

16

17 This study aimed to describe the development and validation of an MCQ examination
18 administered in Australia to assess overseas educated dietitians for readiness to practice in
19 Australia. The findings show that the 120 MCQ examination has thus far shown acceptable
20 reliability and validity across eight separate administrations, and provides a suitable basis for
21 decisions about candidates' competence. The examination is an important milestone in the
22 overall assessment for overseas-educated dietitians or those seeking to return to practice in
23 Australia, and may serve as a model for other professions and the dietetic profession
24 elsewhere.

25

1 **Funding source**

2 [Blinded]

3 **Conflict of interest**

4 [Blinded]

5

6 **Authorship**

7 [Blinded]

8

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For Peer Review

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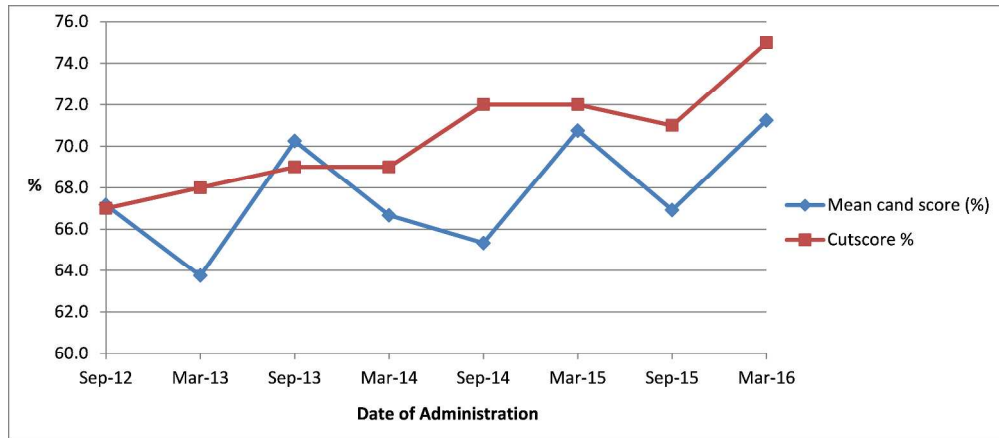


Figure 1: Mean candidate scores and corresponding cutscores for each administration of the DSR MCQ examination

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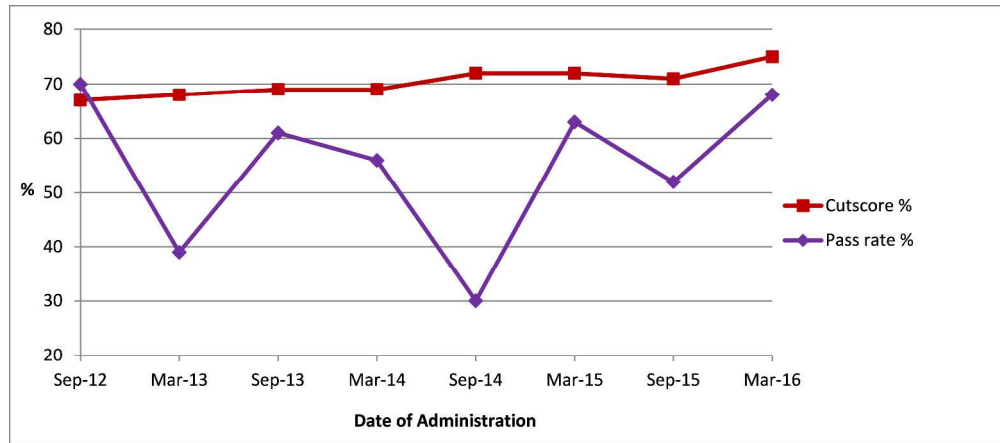
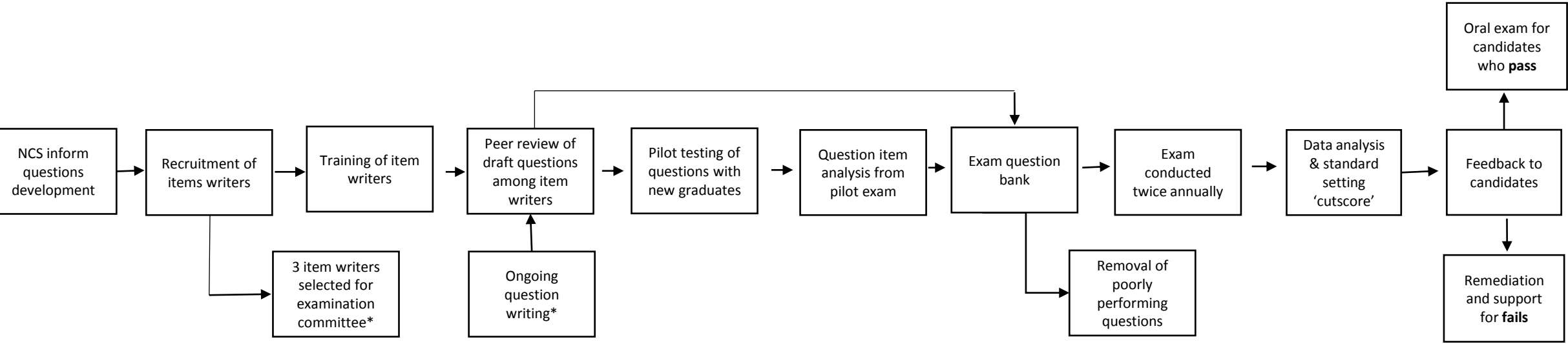


Figure 2: Cutscores and corresponding pass rates for each administration of the MCQ examination

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NCS = National Competency Standards

*Examination committee made up of Dietitians Association of Australia Accreditation and Recognition Manager & Recognition and Journal Services Dietitian, three item writers and MCQ expert academic consultant.