Self-Perceived Competency Assessment among Dietetics Students in Universiti Sultan Zainal Abidin (UniSZA)

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Received: 1st August 2023        Accepted: 23rd October 2023        Published: 24th December 2023

Abstract
This study aimed to assess the self-perceived competency among dietetics students at Universiti Sultan Zainal Abidin (UniSZA). The self-perceived competency of the students was evaluated using the Nutrition Competence (NUTCOMP) questionnaire, a validated tool designed to measure the self-perceived competence of healthcare professionals, including dietitians, in providing nutrition care to patients with chronic diseases. A total of 54 dietetics students from UniSZA participated in the study, all enrolled in Year 4 Semester 2 during their clinical training. They completed the NUTCOMP questionnaire, which consists of various domains and items related to nutrition care practice, including communication skills, critical thinking, evidence-based practice, and professionalism. The results showed that the students perceived themselves to have a high level of competency, with a mean score of 140.1 and a standard deviation of 26.83. Specifically, the students reported high levels of confidence in their ability to interact with clients and stakeholders, interpret nutritional information into lay language, and apply critical thinking skills to research and evaluate nutrition practices. In summary, the study’s findings reveal that graduating dietetics students at UniSZA generally have a positive self-perceived competency in nutrition care, indicating that they feel well-prepared to enter the field. However, it’s important to note that self-perceived competency may not always align with actual performance, necessitating the need for objective assessments to validate these perceptions. Future research should explore the relationship between self-perceived competency and actual performance in dietetics practice. Additionally, investigating the factors that influence competency development among dietetics students is crucial. Enhancing competency in future dietitians is essential for improving the quality of nutrition care and, ultimately, achieving better health outcomes for patients.

Keywords
Self-perceived competence, Usability, Dietetics, Skills, Nutrition Competence

Introduction
One of the career options available to dietetics students is to become a clinical dietitian, and a crucial aspect of their journey involves clinical placements to develop the skills and preparedness needed as future...
dietitian graduates. In these clinical placements, dietetics graduates have been taught with the Nutrition Care Process (NCP) to enhance their decision-making abilities and clinical judgement when delivering nutrition care to patients. In recent years, technological advancements, particularly in the form of mobile health apps (mHealth), have emerged as tools to support healthcare professionals, including clinical dietitians, in delivering systematic nutrition therapy using the NCP, especially in outpatient settings.

The use of mHealth apps during the NCP has the potential to enhance healthcare professionals’ self-perceived competency, a dynamic concept encompassing knowledge, skills, and attitudes that contribute to safe and effective medical practices \cite{1,12}. Specifically, the NUTrition COMPetence (NUTCOMP) questionnaires are designed to measure the self-perceived competence of health professionals in providing nutrition care \cite{1}. Assessing the competency of primary health professionals in nutrition care poses challenges, making tools like NUTCOMP questionnaires valuable in evaluating self-perceived competence.

Concerns have been raised regarding the readiness of clinical dietetics graduates to meet the demands of the profession. Studies have highlighted the issue of overproduced graduates with inadequate skills for the future workforce \cite{8}. This sentiment is echoed among undergraduate dietetics students, who often express worries about developing practical abilities during clinical training in hospitals as they approach their final year of study. Considering the high turnover rates in the field of dietetics due to limited opportunities for career advancement, the relevance of graduates’ skills to the needs of the employment market is a crucial consideration \cite{4}.

Therefore, this study aims to comprehensively document the self-perceived competency of undergraduate dietetics students before developing mHealth apps, with a particular focus on those undergoing clinical training in outpatient settings. By providing valuable data on the self-perceived competency of dietetics students, this study seeks to bridge the knowledge gap and contribute scientific evidence to inform the development of mHealth apps tailored specifically for dietitians. Beyond its direct benefits for dietetic students, these findings hold significant implications for various stakeholders. Researchers in the field of healthcare and education can utilize this data to further investigate and understand the factors influencing self-perceived competency among students. Clinicians can gain insights into the readiness of future dietitians entering clinical practice, allowing for tailored support and mentorship programs. Moreover, society at large benefits from well-prepared dietetics students entering the workforce. These students are likely to provide higher-quality nutrition care, leading to improved health outcomes for patients. Ultimately, this study’s findings contribute not only to the professional development of dietetics students but also to the enhancement of healthcare services and the overall well-being of the community.

Additionally, the findings from this study could have far-reaching implications for the field of dietetics, offering insights into the strengths and areas for improvement in dietetics students’ self-perceived competency. To the best of our knowledge, this is the first study that investigates the issue of self-perceived competency among dietetics students in Malaysia. Studies on self-perceived competency focusing on nutrition care have been conducted in Australia and New Zealand, involving personal trainers, nursing students, and medical students \cite{2,3,6}. As the demand for skilled and competent dietitians continues to grow, the contribution of this study can pave the way for a more robust and effective dietetics workforce, better equipped to address the complex nutritional needs of the population. Therefore, the study aims to address the knowledge gap on the self-perceived competency of dietetics students in Malaysia.

**Materials and Methods**

**Study design**

The study design was a descriptive cross-sectional study design that provided data for describing the scores obtained at a single point of time in identifying the self-perceived competency among the undergraduate dietetic students of batch 11 (intake of 2019/2020).
Ethical statement
Ethical approval was obtained from the UniSZA Human Research and Ethics Committee (UHREC) on the 22nd of December 2022 and it was approved on the 9th of March 2023 (Ref: UniSZA.800-1/1/2 (ld.2 (47)).

Study population
This study is conducted at the main campus of University Sultan Zainal Abidin (UniSZA), located at Gong Badak Campus in Kuala Nerus, district of Terengganu Darul Iman. The study population involved UniSZA undergraduate dietetic students who would undergo clinical training in an outpatient setting during their final year, with a sample size of 54 participants.

Variable and measurement
Variables measured in this study included the sociodemographic profile (gender, ethnicity, age) and NUTCOMP scores.

NUTritions COMPetence Tool (NUTCOMP)
In the context of this study, the NUTCOMP tool has not been specifically validated among Malaysian participants. However, it's worth noting that in a previous study, the NUTCOMP tool demonstrated robust psychometric properties. Internal consistency was measured using Cronbach's alpha, which ranged from 0.88 to 0.98 for each construct and reached an impressive 0.98 for the entire set of items (35 items with 4 constructs). Additionally, correlation coefficients for test-retest reliability ranged from 0.89 to 0.94 for each construct and 0.95 for all items taken together, indicating very high test-retest reliability [1].

For clarity, here are the total scores for each domain of the NUTCOMP tool:
- Domain 1: Confidence in Knowledge about Nutrition and Chronic Disease - Total Score: 27.2 (Mean ± SD: 6.04)
- Domain 2: Confidence in Nutrition Skills - Total Score: 43.1 (Mean ± SD: 8.12)
- Domain 3: Confidence in Communication and Counselling about Nutrition - Total Score: 33.9 (Mean ± SD: 7.39)
- Domain 4: Attitudes Towards Nutrition Care - Total Score: 35.9 (Mean ± SD: 5.28)

The NUTCOMP tool, with its strong psychometric properties and the provided domain total scores, serves as a valuable instrument for assessing self-perceived competency among dietetics students, even though it hasn’t been specifically validated within the Malaysian context for this study.

Data collection
The data collection involved two phases, including the recruitment of undergraduate dietetic students and conducting the survey to gather data on their self-perceived competency.

Recruitment of undergraduate dietetic students
In this phase, 54 undergraduate dietetics students were recruited for the study. The researcher utilized various online platforms, such as WhatsApp and Instagram, to contact the potential participants. Participants who voluntarily expressed their interest in taking part are given a brief explanation of the main objective of the study and granted access to the online recruitment information.

Briefing and Answering Survey
The second phase involves a cross-sectional study design, where 54 recruited undergraduate dietetics students participated. The researcher conducted a comprehensive briefing, explaining the study's procedures and purpose. The participants who met the eligibility criteria and voluntarily to participate in the study are required to fill in the consent form first before completing the NUTCOMP questionnaires. The completed surveys were stored securely on Google Drive. Subsequently, the data obtained from the survey were prepared for data entry and analysis using IBM SPSS 27.0. Descriptive statistics is used to obtain the mean values with standard deviations of the NUTCOMP scores, which helped determine the participants' self-perceived competency.
In this study, we specifically calculated the mean values and standard deviations of the NUTCOMP scores. The ‘mean’ is essentially the average score of the participants’ responses. It provides a central measure that helps us understand the typical or average level of self-perceived competency among the participants.

The ‘standard deviation’ is a measure of the variation or spread in the data. It indicates how much individual responses tend to deviate from the mean. A smaller standard deviation suggests that most responses are close to the mean, while a larger standard deviation indicates more variability in the responses. By calculating these mean values and standard deviations for the NUTCOMP scores, we were able to summarize the participants’ self-perceived competency in a way that provides a clear, quantitative picture of their assessments. This analysis helps to interpret the data and derive a significant finding regarding the self-perceived competency among the participants.

Results

Sociodemographic Characteristics

A total of 54 participants were eligible and enrolled in the study for the self-perceived competency assessment, and the sociodemographic characteristics of the respondents are shown in Table 1. The majority of respondents, with a mean age of 23.7 (SD 1.13). Out of the respondents, 50 (92.6%) were females, and 4 (7.4%) were males. Moreover, 51 (94.4%) of the respondents identified as Malay, while three (5.6%) respondents identified as Indian.

Table 1: The sociodemographic characteristics of the self-perceived competency’s participants (n=54)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
<th>Mean± Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td></td>
<td></td>
<td>23.7±1.13</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>92.6</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>51</td>
<td>94.4</td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>3</td>
<td>5.6</td>
<td></td>
</tr>
</tbody>
</table>

Self-Perceived Competency Among Undergraduate Dietetics Students

Table 2 shows the NUTCOMP scores of undergraduate dietitian students for each construct and overall (n=54). The findings of the study reveal that the dietetics students exhibited a high level of self-perceived competency, as indicated by the mean NUTCOMP score of 140.1 out of a total possible score range of 1 to 5 (total score: 175). The standard deviation of 26.83 suggests a moderate level of variability among the participants’ competency levels. These results indicate an overall high competency level among the students.

Furthermore, most of the participants (43 out of 54) self-rated their competency level as high, further reinforcing the notion of a high level of self-perceived competency among the students. This self-assessment aligns with the mean NUTCOMP score and provides additional support for the overall high competency observed in the study. It is crucial to acknowledge that this self-assessment is not reflects the actual performance of participants even though it provides an insightful information regarding self-perceived competency. Since the questionnaire is self-administered, it lacks the capacity to control or mitigate students from potentially overestimating their competency. This limitation underscores the necessity for future research to explore the alignment between self-perceived competency and real-world performance among dietetics students.

The highest score in percentage for the NUTCOMP domain was observed in Domain 4 (89%), which relates to attitudes toward nutrition care (μ=35.9, σ=5.28). On the other hand, Domain 3, which encompasses
confident in communication and counselling about nutrition, received the lowest score (75%) among all
the domains, indicating a potential area for improvement.

Table 2: NUTCOMP scores of undergraduate dietitian students for each construct and overall (n=54)

<table>
<thead>
<tr>
<th>NUTCOMP domains</th>
<th>No of Items</th>
<th>Total Score (Mean ± SD)</th>
<th>Total Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain 1: Confidence in Knowledge about Nutrition and Chronic Disease</td>
<td>7</td>
<td>27.2 (6.04)</td>
<td>77</td>
</tr>
<tr>
<td>Domain 2: Confidence in Nutrition Skills</td>
<td>11</td>
<td>43.1 (8.12)</td>
<td>78</td>
</tr>
<tr>
<td>Domain 3: Confidence in Communication and Counselling about Nutrition</td>
<td>9</td>
<td>33.9 (7.39)</td>
<td>75</td>
</tr>
<tr>
<td>Domain 4: Attitudes Towards Nutrition Care</td>
<td>8</td>
<td>35.9 (5.28)</td>
<td>89</td>
</tr>
<tr>
<td>Overall NUTCOMP Scores</td>
<td></td>
<td>140.1 (26.83)</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

According to the findings of our study, most undergraduate dietetics students at Universiti Sultan Zainal Abidin assessed their own perception of their level of competency as being high. This finding suggests that the students are confident in their knowledge and skills related to nutrition care. It also reflects a positive perception of their preparedness to enter the field of dietetics upon graduation. The highest score in percentage for NUTCOMP domain is observed in Domain 4 (89%), which relates to attitudes towards nutrition care. This suggests that the participants possess the necessary knowledge, skills, and positive attitudes towards nutrition care, which are essential for effective practice in dietetics. However, Domain 3 received the lowest score among the four domains, indicating that participants may benefit from additional training or support to enhance their confidence in effectively communicating and counselling clients about nutrition-related matters.

Furthermore, the students generally believed themselves to be competent in various practice-related areas of dietetics, as evidenced by their mean score of 140.1 out of a maximum potential score of 175. This finding aligns with similar studies conducted in New Zealand that assessed the self-perceived competency among third-year nursing students and a study conducted in Australia that assessed the self-perceived competency among medical students [3,6]. In both studies, the students self-rated their competency level as moderate to high. Additionally, a study conducted in Australia focusing on the self-perceived competency of personal trainers toward nutrition care found that they self-rated themselves as confident in providing nutrition care for their clients [2]. However, there was one study that utilized a different tool, the Competency Inventory for Registered Nurse (CIRN) questionnaire, to determine self-perceived competency. In this study, new nurses self-rated themselves as having moderate competency [11].

Numerous factors, including the Dunning-Kruger effect, confidence in academic performance, little exposure to real-world challenges, and social comparisons, can cause students to overestimate their level of competency [5,10]. The first factor is the Dunning-Kruger effect, a cognitive bias in which individuals with low ability in a particular domain tend to overestimate their competence. This means that individuals who are less experienced or have limited knowledge may overestimate their competency due to a lack of awareness of their limitations [5,10]. Ensuring the validity of self-assessment tools like NUTCOMP requires careful consideration of potential biases, including the overestimation of competency by individuals with limited knowledge or experience. One strategy to overcome this matter is to incorporate objective assessments or evaluations alongside self-assessment. By comparing self-perceived competency with
actual performance, educators and researchers can gain a more accurate understanding of individuals' capabilities.

The second factor is confidence in academic performance. Some students may have performed well academically, earning honour roll status or favourable comments from teachers. This academic accomplishment can support a sense of self-assurance and the conviction that they are highly competent. The third factor is limited exposure to real-world challenges. It is possible that during their studies or early professional careers, they did not come across complicated real-world scenarios or difficult circumstances. As a result, people might have faith in their skills based on how well they perform in regulated or simulated conditions.

Finally, social comparison. People frequently assess themselves against their peers. If individuals perceive their skills to be at the same level or even superior to those around them, they may tend to rate themselves as more competent. These factors collectively contribute to the tendency of students to perceive themselves as more competent than they may be, highlighting the importance of providing practical experiences and realistic challenges to foster a more accurate understanding of one's abilities. While self-assessment tools like NUTCOMP can provide valuable insights into students' perceptions, they alone may not offer a complete and accurate picture of their competency. To address this limitation and enhance the tool's validity, it is essential to cross-validate these self-perceived competency assessments with students' actual performance in real-world scenarios. This cross-validation ensures that students' self-perceptions align with their practical capabilities, ultimately providing a more comprehensive and reliable assessment of their competency.

However, several limitations had been acknowledged. Firstly, due to time and financial constraints, the study only included a small sample of dietetics students. As a result, it is likely that the findings cannot be generalized to all dietetics students.

**Conclusion**

In conclusion, this study serves as a crucial needs assessment by examining the self-perceived competency of dietetics students. The findings offer valuable insights into the students' confidence and perceived skills related to nutrition care, providing a foundation for the targeted educational interventions and curriculum enhancements. The high level of self-perceived competency among the students indicates a positive outlook on their future roles as dietitians. However, it is essential to acknowledge that self-perceived competency may not always align with actual competence. Thus, future research utilizing objective measures is needed to validate and complement these self-perceptions.

The study's findings hold significant implications for improving the training and preparation of future clinical dietitians. By harnessing the potential of mHealth apps to bridge the gap between theoretical knowledge and practical application, these technological tools can play a vital role in enhancing the skills and confidence of future dietitians in delivering effective nutrition care to patients. As the demand for skilled and competent dietitians continues to rise, the valuable insights gained from this study pave the way for a more robust and effective dietetics workforce, better equipped to address the complex nutritional needs of the population. This research can serve as a foundation for further investigations into competency development among dietetics students and the effectiveness of mHealth apps in supporting their learning and practice.

**Funding**

The research was supported by Universiti Sultan Zainal Abidin under the Scholarship of Teaching and Learning (SoTL) UniSZA 2022 (UniSZA/SoTL/2022/01).
Acknowledgements
We would like to extend the deepest gratitude and acknowledge all the participants who generously dedicated their time for this study. Their invaluable contributions have added depth and meaning to fulfilling the objectives of this research. We also thank Center for Management of Academic Excellence & Innovation (CoMAE-i), Universiti Sultan Zainal Abidin for the grant support.

Conflict of Interest Disclosure
None to declare

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