

# Knowledge, Attitude and Practices about Nutrition among Resident Physicians in a Tertiary Hospital: A Cross-Sectional Study\*

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## ABSTRACT

In the Philippines, the escalating double burden of malnutrition necessitates an exploration of healthcare professionals' nutrition proficiency. This study aims to evaluate the nutrition knowledge, attitudes, and practices of resident physicians, providing insights into areas that may require enhancement in their nutrition-related competencies. This study aims to assess Resident Physician's knowledge, attitude, and practices regarding nutrition. Employing a descriptive, cross-sectional prospective design, the study surveyed resident physicians working at a tertiary government hospital from January 2021 to March 2023. Data collection utilized self-administered questionnaires, incorporating structured and open-ended questions. Data were subjected to descriptive analysis, with frequencies, percentages, and means presented. The Kruskall-Wallis test, chi-square test and Correlation Phi Coefficient were employed for statistical comparisons. This pioneering exploration among 97 resident physicians underscores their strong recognition of fundamental nutritional aspects. Knowledge levels varied from moderate (61.9%) to excellent (32.9%), with a minority having poor knowledge (5.2%). A significant relationship between years of residency and knowledge ( $p$  value= 0.01 Kruskall Walis, 0.029 Chi square), along with a strong relationship correlation was observed. The connection between attitude and practice to years of residency was less pronounced. Findings reveal knowledge gaps and potential disparities between attitudes and practices across different year levels, offering insights for tailored educational interventions and future research. The study underscores the imperative for targeted interventions to strengthen nutrition education among resident physicians. It signifies bolstering nutrition education to advance better patient care.

**Keywords:** Nutrition, residency, malnutrition

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## INTRODUCTION

Nutrition and related lifestyle factors have been well established to be of importance in the management of diseases and in the promotion of well-being in health. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth, lower risk of non-communicable diseases, and longevity<sup>1</sup>. However, we are still grappling with the double burden of the disease of both over and under nutrition<sup>2</sup>. Recent data from the Centers for Disease Control and Prevention (CDC) has reported a notable increase in obesity rates, with a rise of 35% or more<sup>3</sup>. This finding aligns with various recent research studies indicating that individuals have experienced significant weight gain since the onset of the COVID-19 pandemic. This increase in weight gain is likely attributable to factors such as a surge in sedentary behavior, heightened stress levels, and various challenges such as job loss and income reduction, which can make it more difficult for people to maintain healthy eating habits<sup>4</sup>. Moreover, recognizing the growing concerns related to nutrition and food security, the National Unified Health Research Agenda for 2023 has been launched, underscoring the importance of research priorities in this area<sup>5</sup>. These developments emphasize the urgency of addressing and enhancing nutrition-related knowledge and practices among healthcare professionals.

In problems in nutrition, highest regard by general public for consult and advise would come from doctors and health related workers. However historically, knowledge and trainings in nutrition for the health professions has been problematic and selective<sup>6,7</sup>. This has been the driving force for increasing need to improve nutrition knowledge such that is crucial for encouraging healthy eating habits for individuals<sup>8</sup>. Nevertheless, knowledge of nutrition alone may not be sufficient to improve dietary behaviors; there is also a need to promote a positive attitude towards healthy eating habits where personal perceptions will be a useful tool<sup>9</sup>.

Even though there are specialization in the medical field, patients always expect to receive a totality in treatment including nutritional counseling, however these expectations are not always met<sup>10</sup>. Several factors have been implicated in that, and some of these barriers include lack of time, lack of nutritional information, lack of payment and lack of patient compliance to diet<sup>11</sup>. Identifying weaknesses in nutrition knowledge, attitudes, and practices among physicians may provide guidance for improving their understanding of nutrition in the future as they may realize that health education can be more effective when medical practitioners receive sufficient information and updates, and if they had made necessary dietary changes themselves, it could directly relate as a personal motivation and behavior to the patient. In an innovative approach to tackle these challenges, this study aims to bridge knowledge gaps while exploring the attitudes and practices of resident physicians. Residents, as they are more commonly called, have a dual role in the health care system in that they are simultaneously learners and medical care providers, acting as both. The overarching goal is to promote a holistic approach to patient care, ultimately leading to improved health outcomes, reduced prevalence of nutrition-related diseases, and enhanced overall well-being. By doing so, it aims to provide insights that can enhance understanding of nutrition and contribute to more effective patient care strategies.

The objective of this study is to evaluate Resident Physician's knowledge, attitude and practices regarding nutrition at a tertiary government hospital. Specifically, it aims to; 1) describe the demographic characteristics of the Resident Physicians 2) determine if there is significant difference between knowledge, attitude, and practices of different year levels of the Resident Physicians, 3) determine if there is correlation between level of knowledge and attitude to practice of the Resident Physicians.

## Materials and Methods

### Research Design and Setting

The research employed a descriptive, cross-sectional prospective study design done at a tertiary government hospital.

### Population

Inclusion criteria involves all resident physicians working at a tertiary government hospital from January 2021 to March 2023. Exclusion criteria are as follows: 1) Resident Physicians who are on Leave of Absence at the time of distribution of questionnaire, 2) Resident Physicians who works at the tertiary government hospital but rotating outside the hospital (i.e. lateral entry), 3) Resident Physician enrolled as the only fifth year resident, 4) The primary researcher.

### Sampling Method and Data Collection

The study employed total population sampling utilizing a self-administered modified questionnaire on knowledge, attitudes, and practices with structured and open-ended questions from previous studies. Validation was done by the Institutional Review Board of the Research Bureau. Each participant was assigned a control code number that signify anonymity. The researcher was the primary floater of questionnaires. Collection of data was done from March 2022 to March 2023. The data was encoded and analyzed using the Microsoft Excel 2018 and SPSS Version 28.

### Data Analysis

Descriptive data analysis was reported as frequencies and percentages. The attitude survey consisted of negative and positive nutrition statements with a five-scale degree of agreement (strongly agree, agree, undecided, disagree and strongly disagree) then all questions were merged to obtain one variable. Coding of practice used a five-scale degree of agreement (strongly agree,

agree, undecided, disagree and strongly disagree) then all questions were merged to obtain one variable. Kruskall-Walis test was used to compare the score of nutrition knowledge between different levels in training and chi-square test ( $\chi^2$ ) and Correlation Phi Coefficient compared the categorical variables of attitude and practice for nutrition among different year levels of physicians.  $P \leq 0.05$  was considered statistically significant and the level of confidence was 95%.

### Ethical Consideration

The researcher followed the consent process in this study. All the participants were knowledgeable about the study intentions and were required to consent before the enrollment. It was explained that the participation is voluntary and confidential. No data was divulged in public as per Republic Act 10173 – Data Privacy Act of 2012. The Institutional Review Board has reviewed this study.

## Results

The demographic characteristics of Resident Physicians included a total of 97 participants as shown in Table 1, out of which 57.7% (n=56) were female and 42.3% (n=41) were male. The age distribution of participants was as follows: 44.3% (n=43) aged between 25 and 29 years, 50.5% (n=49) aged between 30 and 34 years, and 5.2% (n=5) aged between 35 and 39 years. Participants were distributed across different year levels in training and distribution was as follows: 40.2% (n=39) were in their first year, 29.9% (n= 29) were in their second year, 15.5% (n=15) were in their third year, and 14.4% (n=14) were in their fourth year. Participants' Body Mass Index (BMI) was categorized into different groups of which 2.1% (n=2) were underweight, 19.6% (n=19) had a normal BMI, 35.1% (n = 34) were overweight, and 43.3% (n = 42) were classified as obese.

**Table 1. Distribution of participants based on sociodemographic factors and BMI**

<b>N=97</b>	<b>Number (n)</b>	<b>Percentage (n%)</b>
<b>Gender</b>		
<b>Male</b>	<b>41</b>	<b>42.3%</b>
<b>Female</b>	<b>56</b>	<b>57.7%</b>
<b>Age</b>		
<b>25-29</b>	<b>43</b>	<b>44.3%</b>
<b>30-34</b>	<b>49</b>	<b>50.5%</b>
<b>35-39</b>	<b>5</b>	<b>5.2%</b>
<b>Length of Years of Experience</b>		
<b>&lt;1-2</b>	<b>48</b>	<b>49.5%</b>
<b>3-5</b>	<b>39</b>	<b>40.2%</b>
<b>&gt;6</b>	<b>10</b>	<b>10.3%</b>
<b>Year Level in Training</b>		
<b>1</b>	<b>39</b>	<b>40.2%</b>
<b>2</b>	<b>29</b>	<b>29.9%</b>
<b>3</b>	<b>15</b>	<b>15.5%</b>
<b>4</b>	<b>14</b>	<b>14.4%</b>
<b>BMI</b>		
<b>Underweight</b>	<b>2</b>	<b>2.1%</b>
<b>Normal</b>	<b>19</b>	<b>19.6%</b>
<b>Overweight</b>	<b>34</b>	<b>35.1%</b>
<b>Obese</b>	<b>42</b>	<b>43.3%</b>

The nutrition-related knowledge assessment results among Resident Physicians exhibited varying levels of understanding and awareness concerning key nutritional concepts. Notably, 100% of participants accurately linked anemia to iron deficiency, while 96.9% correctly associated vitamin A deficiency with night blindness. This signified a strong grasp of fundamental nutritional aspects<sup>1, 12</sup>. However, only 49.6% accurately recognized that fruits and vegetables provide "All of the above" nutrients, encompassing carbohydrates, vitamins, minerals, and protein. Similarly, just 19.6% correctly identified

the caloric content of carbohydrates, fats, and proteins as 4, 9, and 4 kcal per gram, respectively, suggesting insufficient physician knowledge about nutritional content<sup>13</sup>.

Several questions highlighted participants' awareness of specific nutrients' roles in health. For instance, 45.3% accurately identified potassium as a nutrient protective against hypertension. Moreover, over half (58.8%) recognized vitamin B9 (folate)'s importance in preventing neural tube defects. The findings also revealed areas necessitating further attention. For instance, identifying cardinal signs of malnutrition (e.g., bilateral pitting edema for kwashiorkor) was correct for 56.7% of participants, while criteria for severe acute malnutrition were correctly identified by 42.3%, indicating the need for reinforcing knowledge in these clinical markers. Likewise, while 88.7% knew the recommended exclusive breastfeeding duration was 6 months, understanding regarding the impact of protein on calcium loss (28.9%) and optimal pregnancy weight gain (50.5%) might benefit from more comprehensive education.

The examination of Resident Physicians' performance across different year levels in residency training reveals distinct variations as shown in Table 2. Participants were categorized as moderate, excellent, or poor based on their responses. Among them, 61.9% fell within the Moderate category, indicating a satisfactory foundational understanding. Notably, 32.9% exhibited an excellent grasp, demonstrating proficient knowledge absorption. Conversely, a smaller group, 5.2%, demonstrated poor nutrition knowledge.

**Table 2. Classification of Nutritional Knowledge**

Level Classification	Year level in Residency Training				Total	p-Value
	1	2	3	4		
<b>Poor</b> <sup>(a)</sup>	<b>3</b> <b>(3.1%)</b>		<b>2</b> <b>(2.1%)</b>		<b>5</b> <b>(5.2%)</b>	<b>&lt;0.0001</b>
<b>Moderate</b> <sup>(b)</sup>	<b>26</b> <b>(26.8%)</b>	<b>15</b> <b>(15.5%)</b>	<b>12</b> <b>(12.4%)</b>	<b>7</b> <b>(7.2%)</b>	<b>60</b> <b>(61.9%)</b>	
<b>Excellent</b> <sup>(c)</sup>	<b>10</b> <b>(10.3%)</b>	<b>14</b> <b>(14.4%)</b>	<b>1</b> <b>(1.0%)</b>	<b>7</b> <b>(7.2%)</b>	<b>32</b> <b>(32.9%)</b>	

<sup>(a)</sup>Knowledge score is less than <6 (25th Percentile)

<sup>(b)</sup>Knowledge score is 6 – <10 (25th – 75th percentiles)

<sup>(c)</sup>Knowledge score is ≥ 10 (75th percentile)

In this study, participants' perceptions regarding the impact of various training types on their current nutrition competency were examined. Data was categorized into four levels: poor, minimal, moderate, and maximal. Notably, medical curriculum, and conferences/continuing medical education stood out, receiving higher ratings in the "moderate" and "maximal" categories. This indicates that these approaches were perceived as beneficial for improving nutrition competency. Residency program, clinical practice and reading and self-directed learning were generally seen as valuable but slightly less influential compared to medical curriculum and conferences. Conversely, undergraduate training garnered more "minimal" ratings, suggesting a relatively lower perceived impact.

The study delved into participants' attitudes revealing that positive attitudes were particularly prevalent in domains related to discussing nutrition, recognizing the importance of nutrition

assessment, and acknowledging severe malnutrition needing specialized care. Importantly, a positive attitude is observed regarding patient motivation as impact for dietary change. Notably, participants across all training years displayed a shared positive attitude toward engaging in discussions about physical activity and nutrition with patients, indicating a collective sense of responsibility in this aspect.

The survey's results shed light on medical professionals' comfort levels across different residency training years regarding various nutrition practices. Participants displayed confidence in tasks like BMI calculation, recommending dietary patterns for diabetes, and explaining dietary cholesterol and saturated fat roles, discussing with lactating mothers its breastfeeding benefits and challenges. However, discussing their own dietary patterns showed higher comfort in early residency years, diminishing in later stages.

**Table 3. Summary of the KAP variables using Kruskall-Walis, Chi square and Correlation Chi Coefficient**

Comparison	Test Statistic using Kruskall-Walis	p-value	Test Statistic Using Chi square	p-value	Test Statistic Using Correlation phi coefficient	Remarks
<b>Knowledge vs Year of residency</b>	<b>13.294*</b>	<b>0.010</b>	<b>17.125*</b>	<b>0.029</b>	<b>0.380</b>	<b>Very strong relationship</b>
<b>Attitude vs Year of residency</b>	<b>4.744</b>	<b>0.314</b>	<b>6.614</b>	<b>0.579</b>	<b>0.248</b>	<b>Strong relationship</b>
<b>Practice vs Year of residency</b>	<b>8.370</b>	<b>0.079</b>	<b>14.725</b>	<b>0.257</b>	<b>0.365</b>	<b>Very strong relationship</b>

\* significant at 0.05

## Discussion

### Knowledge

The study underscored the importance of tailored continuous nutrition education for Resident Physicians' specific needs. Variations in response rates stressed the necessity of targeted interventions to address gaps in nutrition knowledge. Participants' diverse perspectives on training methods' effectiveness were highlighted, with "Moderate" and "Maximal" ratings for Medical Curriculum, and Conferences/continuing Medical Education signifying their crucial roles. Residency program, clinical practice and reading and self-directed learning were seen as valuable aspects as well. This accentuates structured curricula, practical training, and hands-on experience in fostering nutrition competency and that self-directed learning complement formal training for comprehensive education<sup>14, 15</sup>. In contrast, varied ratings for Undergraduate education suggest potential for improvement. These differences might relate to perceptions from previous studies, implying a need to enhance undergraduate nutrition curriculum<sup>16,17</sup>.

### Attitudes

The study revealed diverse attitudes among participants, particularly regarding the effectiveness of nutrition counseling and perceptions about eating pleasures versus health benefits. These disparities seemed rooted in differences in training, personal beliefs, and nutrition education exposure. To foster cohesion, targeted interventions could emphasize nutrition education's significance, promote evidence-based practices, and encourage open dialogues on contentious topics such as what was described in a previous study<sup>18</sup>. Positive attitudes towards holistic care, as indicated by discussions on physical activity and nutrition, underscore the integration of nutrition in medical education. Addressing the varying perspectives through a standardized curriculum might establish a uniform foundation. Likewise, ongoing education and

dialogue within the medical community are vital to cultivate a shared understanding of nutrition's role<sup>19</sup>. By addressing diverse attitudes and refining education strategies, a consistent and effective approach to nutrition care can be achieved. Negative responses were evident concerning perceptions of nutrition counseling as a good use of professional time and the significance of diet's impact on extending life. These viewpoints shed light on differing perspectives, also strengthening resident's belief on the importance on nutrition education to patients as recommended by Food and Agriculture Organization of the United Nations to improve food security and in prevention and treatment of all forms of malnutrition<sup>20</sup>.

### Practices

The study's findings revealed varying comfort levels in nutrition practices associated with different stages of residency training. As training advances, a decrease in comfort is observed in specific tasks, likely due to their growing complexity. This underscores the continuous requirement for ongoing education and training to bolster competence and confidence across all dimensions of nutrition care<sup>21</sup>. In certain areas, neutral responses emerged, notably in managing severely malnourished children, discussing omega-3 and omega-6 fatty acids, and addressing topics like calories per gram and metabolic roles. These neutral responses indicate potential areas that warrant more focused training to alleviate uncertainties and enhance comprehension.

### KAP Variables

The study's outcomes affirmed a strong knowledge-year of residency connection, pointing to the benefits of experience and professional growth during residency in which as it becomes harder through training still its fundamental goal of training is education<sup>22</sup>. The mixed findings regarding attitude suggest that attitude dynamics are more intricate than solely reliant on years of residency. External factors, like evolving medical

practices and institutional culture, could contribute to residents' attitudes.

Regarding practice-year of residency, the inconclusive results underscore the multifaceted nature of this relationship, potentially influenced by both residency experience and external factors. A parallel investigation scrutinized the relationship between the number of years engaged in professional practice and the KAP scores, which yielded similar results by failing to identify a statistically significant effect<sup>19</sup>.

The implications of these findings suggests that the years spent in residency practice might not be a sole determinant in predicting the variable under investigation. Secondly, the lack of a statistically significant effect in both studies prompts a reconsideration of the assumptions that underlie the connection between practice experience and the targeted variable. This, in turn, necessitates a more nuanced approach to understanding how medical professionals' practice years interact with various factors to influence the outcome.

## Conclusion

The study's insights illuminated the knowledge, attitudes, and practices of Resident Physicians concerning nutrition, underscoring the importance of targeted educational interventions across different year levels. Tailored strategies can enrich nutrition-related knowledge, cultivate evidence-based practices, and facilitate comprehensive patient care. Moreover, the study underscores the adaptability of educational approaches to meet evolving needs in the medical profession. By bridging knowledge gaps and promoting evidence-based practices, healthcare providers are equipped to deliver effective holistic patient care. Furthermore, the research revealed the diverse impacts of training methods on perceptions of nutrition competency. The incorporation of comprehensive curricula, hands-on experiences, and effective continuing education

assumes critical roles in nurturing nutrition skills. Recognizing the diverse attitudes towards nutrition within the medical community becomes crucial for a cohesive delivery of nutrition care. Addressing uncertainties and challenging negative beliefs through education contributes to a well-rounded healthcare workforce.

Future research could delve into the long-term effects of educational interventions on enhancing nutrition competency among Resident Physicians, offering insights into sustained impacts and effective methodologies. Expanding the scope to other healthcare facilities and incorporating a wider array of healthcare workers could provide a more comprehensive understanding. Additionally, ensuring an equal representation of years in practice within the sample could offer a nuanced perspective on the relationship between practice duration and nutrition competency. It is recommended to establish ongoing professional development programs that enhance healthcare professionals' understanding of nutrition, ensuring alignment with current guidelines and practices.

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