

# Determinants of Research Capacity and Involvement of Hospital Dietitians in Selected Hospitals in Metro Manila

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## ABSTRACT

**Objective.** This study aimed to: 1) describe the current state of research activity/involvement and capacity among selected tertiary level government and private hospital dietitians; 2) identify factors associated with research capacity and involvement; and 3) develop policy recommendations to improve the current research activity/involvement towards evidence-based practice among hospital dietitians.

**Methods.** This is a cross-sectional descriptive study. A total of randomly selected 181 hospital dietitians from selected hospitals in Metro Manila completed a pre-tested structured self-administered questionnaire, which elicited the socio-demographic characteristics, research activity/involvement, research capacity, perception, attitude and knowledge (PAK) of the respondents.

Descriptive statistics were generated. Pearson Correlation was determined between socio-demographic characteristics and research activity/involvement score and research capacity score. Linear multiple regression analysis was conducted to test whether perceptions, attitudes and knowledge score are factors that predicted research activity/involvement and research capacity.

**Results.** No significant difference was observed in hospital dietitians' research capacity scores based on gender, age, educational attainment, hospital affiliation, and job description. Majority (97%) of the hospital dietitians had very little participation (10%) or involvement in any type of research activity/involvement. The significant factors that were predictive of research activity/involvement scores and research capacity scores were percent of time for research and hours per week devoted to research, respectively. Percent of time for research was significantly predictive of research knowledge of respondents.

**Conclusion.** The findings in this present study showed the research activity/involvement and capacity of hospital dietitians in Metro Manila were dismally low. The significant factors that were predictive of research activity/involvement scores and research capacity scores were percent of time for research and hours per week devoted to research, respectively. To support the development of research capacity and involvement of hospital dietitians, policy-makers and healthcare organizations can optimize capability-building strategies at the academic level, hospital dietitian level, and institutional level.

*Key Words: research involvement, research capacity, research culture, research capacity building, hospital dietitians*

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## INTRODUCTION

The crucial application of evidence-based findings in substantiating the impact of nutrition-dietetics on health care outcomes, and its cost-effectiveness foretells the demands for nutrition services. Research-active clinicians have higher expectation from hospital dietitians to prove

their value by providing evidence on the effectiveness of their dietary interventions.<sup>1,2</sup> Thus, the competencies of hospital dietitians to enhance research skills and actively participate in research is deemed imperative to optimize quality health care delivery. However, an enabling research culture, or an environment that enables and supports research, is necessary in motivating interest and building research capacity.<sup>3</sup> A positive research culture within health care institutions may facilitate evidence-based clinical practice and support research capability building that could drive quality in service delivery and health care policies.<sup>4-7</sup>

Hospital dietitians' capacity and involvement in research is largely determined<sup>1</sup> by motivators for research.<sup>8</sup> Likewise, organizational research culture and support, quality of research training, scope of practice and provision of research time in the current appointment are enabling factors for research participants.<sup>9</sup> Research capacity predictors<sup>10,11</sup> on the other hand include research infrastructure, research culture, personal motives, perceptions, research orientation, training, and mentoring.<sup>12</sup> These predictors are enablers<sup>13,14</sup> of sustained research activity/involvement and capacity which are conducive to creative thinking that can impact on health and wellness.<sup>15,16</sup>

Hospital dietitians usually collaborate with the health care team in order to resolve the current challenges in clinical nutrition. However, majority of the hospital dietitians reported that only about 10% of their workload has been dedicated to research activities.<sup>17</sup> Studies in various developed countries revealed low participation of hospital dietitians in research, and the integration of research into practice is limited.<sup>16</sup> Recognition<sup>19</sup> and increased credibility are some of the motivating factors<sup>18</sup> in research activity/involvement and capacity enhancements.<sup>7</sup> The strongest barriers<sup>20</sup> are lack of interest, inadequate training and experience, work role, protected or guaranteed time and organizational support.<sup>8</sup> In such context, a strategic approach like research mentoring with professional supervision and positive research culture are needed to improve the critical mass of hospital dietitian researchers.<sup>21-24</sup> While undergraduate dietitians may feel confident to apply research capacity to practice in their future workplace<sup>6</sup>, evidence suggests that this confidence is not easily demonstrated by dietitians once in practice.<sup>24</sup>

Thus, research competence entails lifelong learnings, skills acquisition, and development as well as right behavior or attitude across scope of practice. Competencies for research have been integrated into the current Philippine core dietetics curriculum, to equip future hospital dietitians with knowledge, skills, and self-confidence, necessary for research activity/involvement.<sup>21</sup> Teaching research methods and hands-on learning experiences increased self-perceived competence in designing, sampling, recruiting, collecting, and analysis, and in communicating research outcome.<sup>6,25, 26</sup> Research activity/involvement among dietitians has been highly correlated with primary area of practice, in that those working in education or research work have more research

experience than those in other areas.<sup>16</sup> Research activity/involvement is embodied in four levels, namely: (1) evidence-based practice which had been considered as the foundation of nutrition and dietetics, (2) research collaboration, (3) research team participation, and (4) leadership in research.<sup>6,27</sup>

In the Philippines, no study has been conducted to assess the driving factors in doing researches, current status of research activities, and research capacity among hospital dietitians in Metro-Manila. Thus, this study aimed to identify the key determinants related to hospital dietitians' research activity/involvement in selected hospitals in Metro Manila. Specifically, the study purported to describe the current state of research activity/involvement and capacity among selected hospital dietitians in Metro Manila; identify factors associated with research capacity and involvement of hospital dietitians; and make recommendations to improve the current research activity/involvement towards evidence-based practice among hospital dietitians.

### Conceptual Framework

A conceptual framework that would serve as a map to show the relationship between relevant variables of interest is shown in Figure 1. Socio-demographic factors such as age, sex, education, and employment are individual characteristics that have a bearing in many events in life. In research, the individual's education and years of professional work enhances the possibility of being involved in research. It is presumed that higher education and higher work experience capacitate a person to be more research-oriented, having been equipped with the knowledge and skills for this intellectual activity. In a work unit, research can be done if there are more staff to ease the work load and allow time for engagement in research. As hospital dietitian, involvement in research is enhanced by factors that motivate research undertakings which stimulate the person to spend more time to conduct research. Perceptions, attitude, and knowledge/awareness on research serve as determinants of being involved and capacitated in research. The factors enumerated influence the ability of the hospital dietitian to

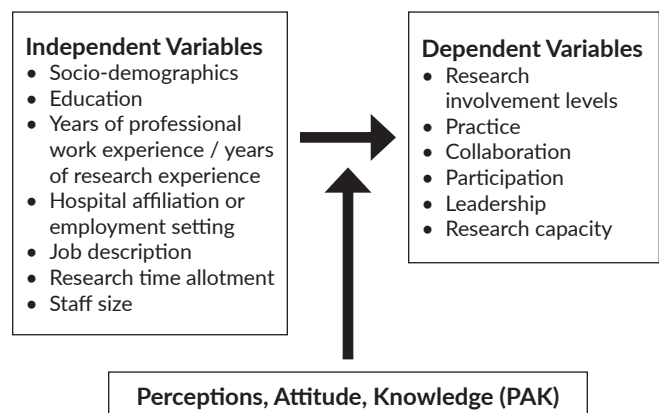


Figure 1. Conceptual Framework.

conduct research. Involvement in research is manifested in terms of practice, collaborative efforts, and participation, and in leading a research study.

### METHOD

#### Research Design, Research Questionnaire and Study Sample

This cross-sectional descriptive study, which used a pre-tested structured self-administered questionnaire adopted from the study of Byham-Gray et al.,<sup>28</sup> elicited the socio-demographic characteristics, research activity/involvement, research capacity, perceptions, attitudes and knowledge (PAK) of the respondents. A telephone enquiry was undertaken among hospital dietitians working in tertiary level in government and private hospitals in Metro Manila to determine the number of regular/permanent hospital dietitian employees in each of the hospitals in Metro Manila. Only hospitals with three or more hospital dietitians were included. Sample size was computed using sampling frame comprising of 400 hospital dietitians. Using Open Epi (Open Epi version 3), a sample size of 187 hospital dietitians was used with a confidence level of 95% and 85% power of the study. The number of hospital dietitians from government (DOH, LGU) and private hospitals were calculated proportionately based on the percentage contribution of dietitian per hospital affiliation.

#### Survey Procedure

After receiving Ethics clearance for Institutional Review Board of Jose R. Reyes Memorial Medical Center in August 2017 with Protocol No. 2017-077, a test was conducted among a panel of 10 content experts in the dietetics profession. Its purpose was to establish face and content validity of the constructed survey instrument. Pre-testing was done among a small group of potential sample participants to determine the questionnaires' reliability. A subset of 35 hospital dietitians was selected, or 18% of the estimated sample size. After the questionnaires were retrieved, it was analyzed and revised according to the results of the pretesting. The hospital dietitians who participated in the pretesting were excluded from the study sample.

With approved Ethics clearance to conduct the study and having signed informed consent, a pre-coded structured pre-tested three-part questionnaire was utilized to determine the current research activities and research capacity of hospital dietitians. Part I covered socio-demographic characteristics of the respondents such as sex, age, level of education, place of work, position/level, number of full-time staff in their department, number of years of work experience, role in the department, number of hours and proportion of full-time equivalent workload per week dedicated to research which represents key antecedent factors.

Part II collected information on current research activity/involvement of the respondents over the past 5 years

categorized into 4 continuum levels of Wylie- Rosett,<sup>29</sup> i.e., Practice, Collaborations, Participation, and Leadership. The Practice level considered hospital dietitians solved problems by employing a research methodology, critical reading of published research or applying the latest findings to practice. Collaboration level covered how the hospital dietitians translated the scientific approaches into publication by serving as a mentor to other hospital dietitians and developing clinical guidelines in one's work setting, as well as writing for peer-reviewed publication. Hospital dietitians' participation was assessed as team members in the conduct of research activities. Leadership role of hospital dietitians in conducting one's own research initiatives has been ascertained as the top of the continuum. Advancement to the next level is dependent on the acquisition of knowledge and skills at the lower levels. Research activity/involvement was defined by the number of research items that respondents were recently involved in (2-3 years), had completed in the past (4-5 years), and never involved.

Research capacity is the adeptness or aptitude to learn, develop and execute the skills that are necessary to engage in research activities. Part III rated the RDs' individual research capacity (skills or success levels) with respect to the different research task using a 5-point Likert scale, where 1 having very low skills, 2, low, 3, average, 4, moderate and 5 for high skill/success.

Hospital dietitians' perceptions, attitudes and knowledge are the independent variables in the framework which in turn can be affected by socio-demographic characteristics, education and training, professional experiences, and employment setting. There were 8 questions on perception which assessed the hospital dietitians' freedom to undertake research, the usage of research results in their work, the importance of research in their field, whether the physicians, administration and co-workers are supportive of hospital dietitians in undertaking research, whether the dietitians have sufficient time to implement new idea, and if the dietitians have a positive attitude to undertake research. There were nine attitude statements. These statements inquired about attitudes such as: research should be carried by all hospital dietitians, involvement in research would benefit the department, doing research improves patient care, I have time to read research, I see research as part of my job, having participation in the research team improves research finding, research is associated with career advancement, research is important for creating evidence of hospital dietitians' efficacy, and evidence-based practice and guidelines are important for hospital dietitians. Twelve questions on knowledge on research were measured which dealt on the dietitian's understanding of statistical analyses, articles show conflicting results, whether literature searches and technical journals in the internet or in print are read, if they believe literature search influence their practice, if they have receive training on search strategy, whether they have access to bibliography at their home, workplace and library, whether they have received

training in critical appraisal and if they have attended courses on evidence-based practice. Part IV measures the perceptions, attitudes and knowledge on research using 5-point Likert scale (Strongly Disagree, Disagree, Neither, Agree, Strongly Agree) as well as a coded dichotomous questions. This part also gathers information on the frequency (everyday, few days of the week, once per week, twice per month, < once per month, never) of literature searches, training and access to bibliographic databases (yes, no), awareness of databases (used, read this, do not use, unaware, not sure) and knowledge of terms (do understand, some understanding, don't understand, not sure). Total scores for perceptions, attitudes, and knowledge were determined separately.

A reliability testing of the instrument was computed for items in Part IV measuring the perceptions, attitudes, and knowledge on research from the Likert scale (strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) using Cronbach's alpha coefficient. Any scale that scored a Cronbach's alpha coefficient of more than 0.70 was considered to have high reliability.<sup>30</sup> For the Cronbach's alpha of the instrument to be considered as acceptable, the value must be greater than 0.70 ( $\alpha > 0.70$ ). The computed Cronbach's alpha of the instrument for each part ranged from 0.884 to 0.995 which means that the internal consistency of the instrument is highly acceptable. This also means that the items all measured the same thing and are all correlated with one another.

## Data Analysis

Variables were analyzed using Statistical Packages for the Social Sciences version 24 (SPSS Chicago, IL, USA). Descriptive statistics (mean, standard deviation (SD), percentages) were used to summarize data on demographic characteristics of the respondents.

Means and standard deviation of scores were compared by independent sample t-test and one-way analysis of variance with least square post hoc test. Pearson correlation was determined between age, level of education, mean research capacity score by current position, years in current position, hours per week devoted to research, number of full-time hospital dietitians in the departments, on the one hand and research activity/involvement score and research capacity score on the other hand.

Univariate test such as Pearson r was done prior to logistic regression. Only the significant variables were included in the regression analysis. Linear multiple regression was used to identify factors that influence PAK, research activity/involvement, and research capacity of hospital dietitians.

## RESULTS

### Descriptive Characteristics

The demographic characteristics of the respondents and mean research capacity scores are shown in Table 1. Of the 187 hospital dietitians given the questionnaire, 181

(97%) returned the filled out questionnaires; 6 (3%) chose not to participate.

Majority of the respondents were female (90.1%). More than half of respondents belonged to the young adults 20-29 years old age group (35.9%) and 30-39 years old age group (26.5%). Majority of them (59.1%) obtained a Bachelor's degree, and about a third (31.1%) of the respondents got some graduate school units. A little more than half (52.5%) of the respondents came from government hospitals. A fifth (20.4%) of the respondents had 2-5 years of experience while a fourth (25.4%), >20 years. Of the 167 respondents who answered their current position, close to half are NDI (27.5%) and NDII (20.4%). Thirty-two percent just indicated their positions as ND with majority of them having general clinical/therapeutic work, a combination of workloads-manager/administrative/clinical, specialist clinical and health promotion work.

Majority of respondents belonged to hospitals with 6-9 (28.5%) and 3-5 (22.3%) hospital dietitians in the dietary department. Six in 10 hospital dietitians (59.3%) did not allot any time for research while 20.3% only allotted 1-2 hours per week.

### Mean Research Capacity Score by Respondent Characteristics

From the highest possible research capacity score of 80, the lowest score of 29.4 was noted among the 60 years old. Mean research capacity scores were significantly higher for those who had more number of hours per week devoted to research ( $p = 0.004$ ). Specifically, the research capacity score was higher for those who spent at least 1-2 hours per week as compared to no time (none) doing research work ( $p = 0.006$ ) based on Scheffe's post hoc method. The number of regular, permanent hospital dietitians in the workplace significantly affected research capacity ( $p=0.03$ ). The more staff available, the higher the mean research capacity of the hospital dietitians.

Research capacity score was not significantly different ( $p= 0.205$ ) between the male respondents (44.2) and the female respondents (39.4), as well as, with age ( $p= 0.21$ ); educational attainment ( $p= 0.309$ ); type of hospitals ( $p=0.168$ ); position ( $p= 0.091$ ); rank levels ( $p= 0.091$ ); and job description ( $p=0.396$ ).

### Research Activity/Involvement

In the past 5 years, majority were never involved in research activity/involvement in all 4 levels, in terms of Practice, Collaboration, Participation, and Leadership as shown in Table 2.

More than two-thirds (64% - 97%) of the hospital dietitians had very little participation or involvement in any type of research activity/involvement at the time of the study.

Among those respondents involved in research activity/involvement within the last 2- 3 years, greater proportion of hospital dietitians had been noted at Level 1 or at practice

**Table 1.** Descriptive Characteristics and Mean Research Capacity Score

Descriptive characteristics	Number	%	Mean research capacity score	SD	p-value
<b>Characteristics of respondents</b>					
Male	18	9.9	44.2	16.511	0.205
Female	163	90.1	39.3	15.541	
All	181	100.0	39.7	15.660	
<b>Age (years)</b>					
20-29	65	35.9	42.1	14.613	0.211
30-39	48	26.5	40.0	14.419	
40-49	32	18.7	37.1	15.567	
50-59	28	15.5	39.6	18.626	
≥ 60	8	4.4	29.4	18.439	
All	181	100.0	39.7	15.664	
<b>Classification of hospital</b>					
Government	95	52.5	41.1	17.073	0.168
Private	83	46.6	37.8	13.991	
All	178	100.0	39.6	15.770	
<b>Highest level of education</b>					
BS	107	59.1	38.1	15.150	0.309
Some graduate school, Master's program, Not completed	56	31.3	41.1	19.960	
Working on Doctorate degree	18	9.9	45.0	11.780	
All	179	100.0	39.7	15.664	
<b>Number of years of hospital experience</b>					
< 2 years	21	11.6	40.8	16.951	0.437
2-5 years	37	20.4	43.1	12.663	
6-10 years	30	16.6	42.2	13.370	
11-16 years	28	15.5	36.9	15.357	
16-20 years	19	10.5	36.7	13.271	
>20 years	46	25.4	37.8	19.267	
All	181	100.0	39.7	15.664	
<b>Current position</b>					
ND I	46	27.5	42.0	12.846	0.091
ND II	34	20.4	40.9	17.654	
ND III	14	8.4	41.4	21.066	
ND IV	13	7.8	27.9	11.882	
ND V	6	3.6	44.0	12.712	
ND Position not specified	54	32.3	37.6	15.392	
All	165	100.0	39.3	15.727	
Missing	14				
<b>Number of hours/week dedicated to research activities</b>					
0	104	59.3	35.6	16.139	0.004
1-2	36	20.3	44.7	14.119	
3-4	14	7.9	45.9	9.6385	
5-6	3	1.7	46.3	7.0238	
7-8	12	7.3	40.9	11.317	
Not specified	6	3.4	49.8	14.662	
All	175	100.0	39.3	15.452	
Missing	6				
<b>Number of regular, permanent hospital dietitians in the department</b>					
0-2	6	3.4	30.7	13.967	0.030
3-5	40	22.3	41.2	14.224	
6-9	50	28.5	40.00	16.001	
10-14	49	27.9	35.0	16.088	
15-24	23	12.8	45.7	16.988	
Others	9	5.0	47.3	7.141	
All	177	100.0	39.7	15.740	
Missing	4				
<b>Job Description</b>					
General Clinical / Therapeutic	90	51.1	39.7	14.345	0.396
Specialist clinical	13	7.4	42.8	13.403	
Manager / Admin / clinical workload	47	26.7	40.6	18.175	
Manager / Admin / no clinical workload	18	10.2	32.9	15.086	
Others	8	4.5	41.5	18.958	
All	176	100.0	39.5	15.686	
Missing	5				

**Table 2.** Proportion of respondents by level of research activities/ research involvement and time of research involvement

	N	<2-3 years		4-5 years		Not Involved*	
		No	%	No	%	No	%
<b>Level 1 – Practice</b>							
1. Using knowledge and skills in problem solving	181	28	15.5	37	20.4	116	64.1
2. Initially evaluate research studies	159	19	10.5	14	7.7	126	69.6
<b>Level 2 – Collaborations</b>							
1. Reviewing clinical practice manuscripts for journal or newsletter as part of my professional role	180	21	11.6	23	12.7	136	75.1
2. Monitoring other colleague concerning the interpretation of research study, results to develop clinical guidelines, about nutrition aspect of clinical questions, scientific approach	180	21	11.7	22	12.2	137	76.1
3. Publishing review papers	176	1	0.6	7	4.0	168	95.5
<b>Level 3 - Participation</b>							
<b>A. Participating in research studies</b>							
1. Searching the literature	180	19	10.6	24	13.3	137	76.1
2. Critically reading the literature	179	22	12.3	19	10.6	138	77.1
3. Using a computer referencing system	180	20	11.1	20	13.3	136	75.6
4. Developing a research question	178	18	10.1	14	7.9	146	82.0
5. Developing research protocol	180	14	7.8	11	6.1	155	86.1
6. Designing questionnaire	181	16	8.8	16	8.8	149	82.3
7. Applying for funding	180	4	2.2	7	3.9	169	93.9
8. Submitting an ethics question	180	6	3.3	9	5.0	165	91.7
9. Consenting subjects	181	20	11.0	12	6.6	149	82.3
10. Collecting data	181	24	13.3	16	8.8	141	77.9
11. Using computer data management	180	12	6.7	20	11.1	148	82.2
12. Analyzing data	179	20	11.2	18	10.1	141	78.8
13. Serving as co-author of a paper for publication	180	7	3.9	6	3.3	167	92.8
14. Presenting research findings at a conference	179	3	1.7	9	5.0	167	93.3
<b>B. Evaluating research needs</b>							
15. Developing clinical guidelines by serving in committees or task forces of professional organization	173	12	6.9	6	3.5	155	89.6
<b>Level 4 – Leadership</b>							
1. Serving as principal investigator of a research study following the whole research process	180	9	5.0	7	3.9	164	91.1
2. Acting as leading author for a research publication	180	6	3.3	5	2.8	169	93.9
3. Receiving research grants as principal investigator	180	2	1.1	3	1.7	175	97.2
4. Reviewing grant applications at the national level	180	2	1.1	3	1.7	175	97.2

\*includes <1 year

level, followed by level 2 or at collaboration level. At participation level or level 3, an average of 13% and 11% of the respondents were searching and critically reading literature searches, respectively and developing research questions. Only 13.3% of the hospital dietitians were involved in collecting data. The rest of the research activities were performed by less than 10% of the respondents.

Higher proportions of hospital dietitians performed Level 1 to 3 research activities in the past 4-5 years compared to those with research activity/involvement in the past 2-3 years. At leadership level in research such as serving as principal investigator, acting as leading author for a research publication, and receiving and reviewing research grants were exhibited by no more than 5% of the respondents.

### Research Capacity by Hospital Affiliation

In general, hospital dietitians in government hospitals had higher research capacity score than hospital dietitians in

private hospitals (p=.029) in terms of formulating research questions, and in providing advice to less experienced researchers (p=.013). On the average, hospital dietitians from both types of hospitals rated themselves as average skilled, with a score of almost 3, in terms of finding relevant literature. Results in Table 3 showed that hospital dietitians have low skill in various steps in conducting research such as in critically reviewing the literature, using computer referencing system, developing a research question, writing research proposal, designing questionnaire, consenting subjects, collecting data, using computer data management systems, analyzing data, writing a research report, and writing for publication in peer-reviewed journals. Likewise, the respondents failed to show capabilities in applying for research funds, submitting an ethics application, presenting research findings at conferences and providing advice to less experienced researchers. Overall, the currently employed hospital dietitians were not equipped in performing various

methods of research as exemplified by having just half the score of 80.

**Perceptions on Research**

Results demonstrated that 77% of the total hospital dietitians in selected hospitals positively considered perceptual indicators on research. Respondent’s perception on research is a bit higher among those employed in government than those in private hospitals. Greater recognition of the importance of research findings in the field of nutrition and dietetics regardless of hospital affiliations has been observed (Table 4).

**Attitude on Research**

The scores of respondents on attitude on research shows that the government- employed respondents had significantly elicited higher attitude score as compared to those from private hospitals in two items. Among those from government hospitals, involvement in research has

been considered beneficial in their department (p=.032) and that doing research improves patient/critical care (p=.014). Respondents from both types of hospitals agreed to the statements that participating in research could improve the relevance of research findings, and impact on creating evidence of hospital dietitians’ efficiency and evidence-based practice and in developing clinical practice guidelines. Respondents neither agreed nor disagreed to the statements that research should be carried out by all, but mindful that research is part of their job and participation in research is associated with career advancement (Table 5).

**Knowledge on Research**

The mean knowledge score of respondents from government and private hospitals of 24.13 and 24.18, respectively, were not statistically significant. The score of 24/39 means out of a perfect score of 39, 61% of the hospital dietitians indicated knowledge in conducting research. Of the scaled practice of knowledge questions, the highest

**Table 3.** Research Capacity Score by Hospital Classification

Research Capacity Items	All Hospitals				
	N	Mean	SD	95% CI	
				Lower	Upper
Finding relevant literature	177	2.99	1.182	2.81	3.16
Critically reviewing the literature	177	2.72	1.055	2.56	2.87
Using computer referencing system	177	2.81	1.330	2.81	1.33
Developing a research question	177	2.65	1.187	2.47	2.83
Writing research proposal	177	2.44	1.229	2.26	2.62
Designing questionnaire	177	2.59	1.184	2.41	2.76
Applying for funding	177	1.81	0.999	1.66	1.96
Submitting an ethics application	177	2.06	1.111	1.89	2.22
Getting consent from subject	177	2.46	1.234	2.27	2.64
Collecting data	177	2.86	1.326	2.66	3.06
Using computer data management systems	177	2.59	1.320	1.40	1.79
Analyzing data	177	2.68	1.207	2.50	2.86
Writing a research report	177	2.62	1.217	2.44	2.80
Writing for publication in peer-reviewed journals	177	2.08	1.215	1.91	2.25
Presenting research findings at a conference	177	2.07	1.147	1.90	2.23
Providing advice to less experienced researchers	177	2.13	1.133	1.96	2.30
<b>Total Research Capacity Score</b>	<b>177</b>	<b>39.7</b>	<b>15.770</b>	<b>37.284</b>	<b>41.977</b>

\*p-value is statistically significant at  $\alpha = 0.05$

**Table 4.** Means and Standard Deviation of Respondents’ Perception on Research by Hospital Category

Perceptions	All Hospitals				
	N	Mean	SD	95% CI	
				Lower	Upper
1. I have freedom to undertake research	178	3.81	.855	3.68	3.94
2. I can use results from a published research in my job	177	4.02	.670	3.92	4.12
3. Research is important in the field of nutrition and dietetics	178	4.67	.677	4.57	4.77
4. Physicians are supportive to dietitians doing research	176	3.66	.860	3.53	3.79
5. Administration is supportive to hospital dietitians doing research	177	3.68	.835	3.55	3.80
6. My co-workers are supportive in undertaking research	178	3.83	.750	3.71	3.94
7. There is sufficient time to implement new idea	178	3.37	.937	3.23	3.50
8. Hospital dietitians have positive attitude to undertake research	178	3.87	.823	3.75	3.99
<b>Mean Total Score</b>	<b>174</b>	<b>30.93</b>	<b>4.414</b>	<b>30.276</b>	<b>31.597</b>

level of knowledge pertained to conducting literature search, and reading technical journals in print, but low in understanding statistical analyses.

Hospital dietitians from private hospitals have better access to bibliographic databases at the place of work (p= 0.014) and at the library (p= 0.054), compared to those in government hospitals. A score for receiving training in critical appraisal was lower than attending courses on evidence-based practice (Table 6).

Specific topics of literature search given by respondents were clinical nutrition, clinical practice guidelines, Fad diets, Enteral Nutrition, Sports Nutrition, Functional Foods and Trends in food service.

In terms of awareness of databases, about half (50%) have used and read the Evidence-based guidelines of the Academy of Nutrition and Dietetics while a smaller proportion (3.5%-15.3%) have used the Herdin, Cochrane, Best-evidence, American College of Physicians Journal, and Evidence-based medicine. Among those databases, the

Evidence-based medicine was used by 15.3%, American College of Physicians Journal by 9.7%. About two-thirds of the respondents have used and read the Evidenced-based guidelines of the Academy of Nutrition and Dietetics (31.1%). Aside from these databases, the respondents gave names of other databases that they have used, heard and known which included the American Journal of Clinical Nutrition, ASPEN, IKOKI, JPEN, Diabetes and Kidney, Diabetes Care, PUBMED, and Science Direct up to date.

### Knowledge of Research Terminologies

About half (49.2%) understood terms such as research design, statistical test, sampling, and clinical evidence, while about 2/3 of the respondents (66.1%- 67.0%) understood hypothesis, research problem and research objective. On the other hand, a third of the respondents understood the terms, meta-analysis (30.7%), systematic reviews (33.7%), relative risk (30.5%), statistical risk (31.1%), and statistical significance (38.3%).

Government					Private					p-value
n	Mean	SD	95% CI		n	Mean	SD	95% CI		
			Lower	Upper				Lower	Upper	
95	3.05	1.299	2.79	3.32	82	2.91	1.033	2.69	3.14	0.440
95	2.78	1.178	2.54	3.022	82	2.65	0.894	2.45	2.84	0.406
95	2.88	1.428	2.88	1.428	82	2.72	1.21	2.45	2.99	0.413
95	2.83	1.277	2.57	3.09	82	2.44	1.067	2.20	2.67	0.029*
95	2.6	1.324	2.57	3.09	82	2.26	1.087	2.20	2.67	0.063
95	2.68	1.24	2.43	2.94	82	2.48	1.114	2.23	2.72	0.244
95	1.88	1.071	1.67	2.10	81	1.73	0.908	1.53	1.93	0.304
95	2.14	1.182	1.90	2.38	82	1.96	1.024	1.74	2.19	0.302
95	2.55	1.34	2.27	2.82	82	2.35	1.09	2.11	2.59	0.299
95	2.92	1.419	2.63	3.20	82	2.79	1.214	2.53	3.06	0.539
95	2.62	1.362	2.34	2.90	82	2.56	1.278	2.28	2.84	0.764
95	2.78	1.306	2.51	3.05	82	2.57	1.078	2.34	2.81	0.259
95	2.75	1.246	2.40	3.00	82	2.48	1.168	2.22	2.73	0.138
95	2.16	1.197	1.91	2.40	82	2	1.089	1.76	2.24	0.363
95	2.2	1.234	1.95	2.45	82	1.91	0.932	1.71	2.12	0.088
95	2.33	1.284	2.06	2.59	82	1.9	0.883	1.71	2.10	0.013*
95	41.15	17.073	37.669	44.625	82	37.852	13.991	34.758	40.946	0.168

Government					Private					p-value
n	Mean	SD	95% CI		n	Mean	SD	95% CI		
			Lower	Upper				Lower	Upper	
95	3.81	0.891	3.63	3.99	83	3.81	0.818	3.63	3.99	0.980
95	4.06	0.665	3.93	4.20	82	3.96	0.675	3.82	4.11	0.325
95	4.69	0.637	4.56	4.82	83	4.65	0.723	4.49	4.81	0.666
95	3.61	0.903	3.43	3.79	81	3.72	0.810	3.54	3.90	0.419
94	3.72	0.873	3.54	3.90	83	3.63	0.792	3.45	3.80	0.442
95	3.81	0.762	3.66	3.97	83	3.84	0.740	3.68	4.01	0.772
95	3.38	1.012	3.17	3.59	83	3.35	0.847	3.16	3.53	0.834
95	3.94	0.873	3.76	4.11	83	3.80	0.761	3.63	3.96	0.253
94	31.05	4.660	30.098	32.008	80	30.00	4.129	29.881	31.719	0.707



**Table 5.** Means and standard deviation of Respondents' Attitude on Research by Hospital Classification

Attitude Items	All Hospitals				
	N	Mean	SD	95% CI	
				Lower	Upper
1. Research should be carried out by all hospital dietitians.	177	2.99	1.182	2.81	3.16
2. Involvement in research would benefit my department.	177	2.72	1.055	2.56	2.87
3. Doing research improves patient/ client care.	177	2.81	1.330	2.81	1.33
4. I have time to read research.	177	2.65	1.187	2.47	2.83
5. I see research as part of my job.	177	2.44	1.229	2.26	2.62
6. Having participation in the research team improves research finding.	177	2.59	1.184	2.41	2.76
7. At my place of employment, research is associated with career advancement.	177	1.81	0.999	1.66	1.96
8. Research is important for creating evidence of hospital dietitians' efficacy.	177	2.06	1.111	1.89	2.22
9. Evidence-based practice and guidelines are important for hospital dietitians.	177	2.46	1.234	2.27	2.64
<b>Mean Total Attitude Score</b>	<b>177</b>	<b>39.7</b>	<b>15.770</b>	<b>37.284</b>	<b>41.977</b>

**Table 6.** Means and Standard Deviation of Respondents Knowledge on Research by Hospital Classification

Knowledge Items	All Hospitals				
	N	Mean	SD	95% CI	
				Lower	Upper
1. I understand statistical analysis.	178	3.58	.772	3.46	3.69
2. Articles in the literature do show conflicting results.	175	3.59	.704	3.49	3.70
3. I conduct literature searches.	115	2.03	1.120	1.82	2.17
4. I read technical journals in the internet.	152	2.04	1.097	1.86	2.221
5. I read technical journals in print.	141	1.74	1.060	1.56	1.83
6. I believe literature search influence my practice.	177	1.92	.271	1.88	1.96
7. I receive training on search strategy.	178	1.39	.489	1.32	1.46
8. I have access to bibliography databases at home.	177	1.31	.462	1.24	1.374
9. I have access to bibliography databases at work.	177	1.33	.473	1.26	1.40
10. I have access to bibliography databases at the library.	176	1.35	.479	1.28	1.424
11. I have received training in critical appraisal.	177	1.243	.430	1.179	1.307
12. I have attended courses on evidence-based practice.	176	1.517	.501	1.44	1.592
<b>Mean Total Knowledge Score</b>	<b>104</b>	<b>24.15</b>	<b>3.780</b>	<b>23.42</b>	<b>24.42</b>

\*p-value is statistically significant at  $\alpha = 0.05$

### Correlation between Factors with Research Activity, Perceptions, Attitudes, Knowledge and Research Capacity Scores

The factors that significantly correlated with total research activity/involvement score were level of education and percent of time per week for research (Table 7). Separate r-values of the components of total research activity/involvement scores such as practice, collaboration, participation and leaderships were also significantly correlated with same variables in the total score except for leadership which only correlated with the percent of time for research. The significant correlation of total research activity/involvement, level of education, time allotment for research, relative to practice, collaboration, participation and leadership could be taken as roadblocks and hindrance in research activity/involvement and capabilities.

Among the PAK variables shown in Table 8, hours devoted to research and percent of time for research correlated with perception and knowledge but not for the attitude score. Research capacity score was correlated with hours per week devoted to research and percent of time per

week for research but was negatively correlated with age of the respondent. These observed results could likewise be regarded as potential obstacles in PAK and research capacity.

### Factors Predicting Research Activity/ Involvement, Perceptions, Attitudes, Knowledge and Research Capacity Scores

The significant factors that were predictive of research activity/involvement scores and research capacity scores were percent of time for research and hours per week devoted to research, respectively. Percent of time for research was significantly predictive of research knowledge of respondents.

## DISCUSSION

### Research Capacity Score

Results of the study demonstrated low research capacity regardless of hospital affiliation. Hospital dietitians working in government hospitals had better inputs in formulating research questions and in mentoring their colleagues. Such observed research capability could be attributed to seniority,

Government					Private					p-value
n	Mean	SD	95% CI		n	Mean	SD	95% CI		
			Lower	Upper				Lower	Upper	
95	3.05	1.299	2.79	3.32	82	2.91	1.033	2.69	3.14	0.440
95	2.78	1.178	2.54	3.022	82	2.65	0.894	2.45	2.84	0.406
95	2.88	1.428	2.88	1.428	82	2.72	1.21	2.45	2.99	0.413
95	2.83	1.277	2.57	3.09	82	2.44	1.067	2.20	2.67	0.029*
95	2.6	1.324	2.57	3.09	82	2.26	1.087	2.20	2.67	0.063
95	2.68	1.24	2.43	2.94	82	2.48	1.114	2.23	2.72	0.244
95	1.88	1.071	1.67	2.10	81	1.73	0.908	1.53	1.93	0.304
95	2.14	1.182	1.90	2.38	82	1.96	1.024	1.74	2.19	0.302
95	2.55	1.34	2.27	2.82	82	2.35	1.09	2.11	2.59	0.299
95	<b>41.15</b>	<b>17.073</b>	<b>37.669</b>	<b>44.625</b>	82	<b>37.852</b>	<b>13.991</b>	<b>34.758</b>	<b>40.946</b>	<b>0.168</b>

Government					Private					p-value
n	Mean	SD	95% CI		n	Mean	SD	95% CI		
			Lower	Upper				Lower	Upper	
95	3.65	.782	3.49	3.81	83	3.49	.755	3.33	3.66	0.172
95	3.58	.723	3.43	3.73	80	3.61	.684	3.46	3.76	0.754
60	2.12	1.130	1.82	2.39	55	1.93	1.103	1.63	2.20	0.367
80	2.06	1.095	1.82	2.31	72	2.01	1.107	1.75	2.27	0.786
71	1.87	1.120	1.61	2.01	70	1.60	.984	1.37	1.78	0.126
95	1.92	.279	1.859	1.973	82	1.927	.262	1.87	1.98	0.788
95	1.34	.475	1.24	1.43	83	1.45	.500	1.34	1.55	0.138
95	1.33	.471	1.23	1.42	82	1.28	.452	1.18	1.38	0.512
95	1.253	.437	1.16	1.34	82	1.43	.498	1.32	1.54	0.014*
94	1.287	.455	1.19	1.38	82	1.427	.498	1.318	1.536	0.054
95	1.242	.431	1.154	1.33	82	1.24	.432	1.149	1.339	0.978
95	1.484	.502	1.382	1.587	81	1.556	.500	1.445	1.666	0.348
53	<b>24.13</b>	<b>3.630</b>	<b>23.13</b>	<b>25.13</b>	51	<b>24.18</b>	<b>3.960</b>	<b>23.060</b>	<b>25.29</b>	<b>0.953</b>

better academic endeavors, higher positions, long term exposure and opportunities for skill enhancement which can be considered as enhancing factors in doing research.

Moreover, the number of hours/week dedicated to research activities and the number of full-time hospital dietitians in the department were enhancing factors for better research capabilities. Those respondents who identified having 10% or more of their role designated to research rated their skill in research higher on all items than respondents who did not consider research as part of their role.<sup>31-33</sup>

The results revealed that research capacity was independent of age of the respondents and maybe indicative that scientific productivity follows a certain life cycle. It means scientific productivity increases at around middle age and subsequently declines.<sup>34</sup> This is in view of the fact that those belonging to 40 years and over were engaged in training, administration and other services, thereby, compromising their research productivity and research activity/involvement.

### Involvement in Research

Majority of respondents admitted non-involvement in research, in view of inadequate research skills and leadership in research continuum. This could be taken as part of research culture in the institutions they have worked for. Involvement in research dealt only in collecting data, or in critically reading and reviewing related literature. Involvement in basic research activities such as using knowledge and skills in problem solving in their day to day practice, could be considered as positive indicator for future active progression of dietitians in research.

This could be traced back to lack of research training and mentoring in the workplace as health professionals and failure to harness the basic research training in their undergraduate degree program. Improvement of the situation could depend on how policies of the institutions is revisited to improve their research culture.

In essence, the study could facilitate in formulating an evidence-based guideline or protocol, where research should be included in their workload, and be made an official requirement in their work description.<sup>35</sup> Hence, allowing

**Table 7.** Correlation of factors related to total score of research activity/involvement and score by activity component

Factor		Research Activity/involvement Score				
		Total score	Practice	Collaboration	Participation	Leadership
Age (yr)	Pearson r	-.065	.039	.045	.066	-.072
	p-value	.496	.667	.602	.462	.402
	n	113	125	136	128	139
Level of education	Pearson r	.330**	.265**	.249**	.378**	.071
	p-value	.000	.001	.001	.000	.345
	n	143	159	175	167	180
Years of experience as ND	Pearson r	.046	.098	.144	.071	.030
	p-value	.589	.217	.058	.363	.691
	n	143	159	175	167	180
Current Position	Pearson r	-.083	.091	-.071	-.031	-.054
	p-value	.442	.372	.460	.755	.572
	n	87	99	110	102	112
Years in current position	Pearson r	.024	.118	.126	.075	.128
	p-value	.781	.143	.142	.341	.089
	n	140	156	136	164	177
Hours per week devoted to research	Pearson r	.126	.141	.099	.118	.025
	p-value	.142	.084	.204	.141	.741
	n	136	151	165	158	170
Percent of time per week for research	Pearson r	.352*	.387**	.320**	.274**	.255**
	p-value	.000	.000	.000	.000	.001
	n	138	152	169	161	173
Number of full-time hospital dietitian staff in the department	Pearson r	.086	.083	.155*	.139	.121
	p-value	.309	.304	.041	.075	.109
	n	141	157	173	165	178

\* Significant at 95% confidence interval; \*\* Significant at 99% confidence interval

**Table 8.** Correlation coefficient of factors related to perceptions, attitudes, knowledge (PAK), and research capacity score

Factor		Research Activity/involvement Score			Research Capacity Score
		Perception	Attitude	Knowledge	
Age (yr)	Pearson r	.022	-.106	.108	-.191*
	p-value	.799	.213	.212	-.025
	n	137	139	136	138
Level of education	Pearson r	.097	.067	-.070	.137
	p-value	.198	.374	.356	.068
	n	177	179	176	179
Years of experience as ND	Pearson r	-.007	-.116	.067	-.127
	p-value	.923	.122	.375	.091
	n	177	179	176	179
Current Position	Pearson r	.083	.017	-.104	-.139
	p-value	.385	.860	.173	.147
	n	111	112	174	111
Years in current position	Pearson r	-.004	-.073	.002	-.024
	p-value	.958	.338	.983	.756
	n	174	176	173	176
Hours per week devoted to research	Pearson r	.166**	.102	-.185*	.188*
	p-value	.032	.187	.017	.014
	n	167	169	166	169
Percent of time per week for research	Pearson r	.224*	.126	-.272**	.273*
	p-value	.003	.100	.000	.000
	n	170	172	169	172
Number of full-time hospital dietitian staff in the department	Pearson r	-.054	.008	-.104	.090
	p-value	.474	.916	.173	.231
	n	175	177	174	177

\* Significant at 95% confidence interval; \*\* Significant at 99% confidence interval

**Table 9.** Factors that predict research activity/involvement, perceptions, attitudes, knowledge, and research capacity scores

Dependent variable	Significant predictors	Standardized coefficient (Beta)	Adjusted R <sup>2</sup>	95 % CI, Lower bound	95 % CI, Upper bound	p-value
Research activity / involvement score (Total)	Percent of time for research	.392	.139	2.835	11.773	.002
Perceptions	No significant variables entered in the equation	-	-	-	-	-
Attitudes		-	-	-	-	-
Knowledge	Percent of time for research	-.250	.050	-1.240	-.063	.030
Research Capacity Score	Hours/week for research activity/ involvement	.264	.057	.533	6.684	.022

- No data

research participation and time allotment for research taken with their clinical and administrative responsibilities should be administratively included. The results showed that lack of staff compliment and possibly, inadequate mentoring can be cited as the biggest barrier in undertaking research productivity. Those barriers are similar to what has been noted by other researches<sup>36,37</sup> while insufficient time is the greatest impediment. Devoting sufficient time for research is associated with greater research productivity.

It is, therefore, reasonable to assume that, when controlling for other factors such as sociodemographic characteristics and employment settings, hospital dietitians with enough time to conduct research could be more research productive than their time-pressured peers. Likewise, knowledge of research was seen as a factor in research productivity, inferring that research work experience allows exposure to contemporary nutrition and dietetic issues and findings relevant to hospital dietitians. Besides the research skills they tend to possess, research-productive hospital dietitians are more likely to have knowledge about how to access technical assistance and funding resources.

Enhancement of research culture and environment within the organization<sup>13,38</sup> such as revisiting the mission, goals and organizational structure,<sup>5</sup> job description details incorporating research workload<sup>20</sup>, attitudes and behavior of clinicians<sup>13</sup> and external partners such as universities in recognizing hospital dietitians as part of the team<sup>17,19</sup>, would enable research training and access to resources.<sup>39</sup> This would ensure a research culture by nurturing the hospital dietitians for better health care delivery system. The findings from the study will provide a basis for developing a strategic development plan for building research capacity, thereby, fostering a strong research culture within dietetics, validating the role of hospital dietitians among medical and scientific communities, in general, and in patient care, in particular.

### Perception on Research

Overall, dietitians considered research as important, that research results are useful and that the work environment is supportive for hospital dietitians to do research, but gave a low score for having sufficient time to do research, confirming results from published researches.<sup>20,40,41</sup>

### Attitude on Research

The positive attitude of the participants on the usefulness of research in improving patient care, the importance of Evidence-Based Practice and guidelines, in creating evidence of hospital dietitians' efficacy was not evident in the values of participating in research as indicated by lower scores obtained for the following statements: "Research should be carried out by all hospital dietitians", "I see research as part of my job", and "I have time to read research articles." These results were similar with the findings of Howard<sup>17</sup>, where only 7 % of the dietitians saw research as part of their job. It is apparent that the intrinsic and extrinsic motives are not attractive enough for hospital dietitians to engage in research. This attitude underscores the little importance attached to this work by hospital dietitians. This suggests the need to change the attitude of dietitians regarding research as an integral part of dietetic practice. Scores for the attitude on benefit of research for the department and for improvement of patient/client were significantly higher among hospital dietitians in government hospitals.

In this study, the appreciation for the value of research was not considered a step toward professional benefit as shown by a low score noted for the attitude statement: "In my place of employment, research is associated with career advancement," confirming earlier findings that research activity/involvement was not an expected activity among hospital dietitians. The low score in attitude that research is associated with career advancement confirms low research involvement, meaning doing research may not be an incentive for professional advancement.

### Knowledge on Research

The total knowledge score of respondents was 24.15 out of a perfect score of 39, suggesting that dietitians' knowledge was average which supports the findings of earlier research.<sup>42</sup> Dietitians who read professional publications more frequently had higher knowledge scores. Significantly higher scores were noted for knowledge about access to bibliography databases at work among government- employed respondents, possibly because of better resources available to them.

Hospital dietitians recognized the value of research in the field of nutrition and dietetics but lacked the time and

ability to critically review the literature or use computer referencing system. Hospital dietitians had a low knowledge score for extracting journals, reviewing publications and databases which may prevent them from applying research findings in clinical practice. The lowest level of awareness among respondents was related to databases. Similar results were reported earlier by other studies.<sup>43,44</sup> Less than 10% of the hospital dietitians in this study used the Cochrane Library. The Evidence-based Guidelines of the Academy of Nutrition and Dietetics was the commonly used database among hospital dietitians.

Respondents' average knowledge scores could be attributed to some problems of accessibility of the research materials at home, at work and at the library, or to little training received in search strategy. This is contrary to results of other studies<sup>43,45</sup> where accessibility to resources was claimed by respondents. More than half, however, were not sure about the terms used in research. About half of the hospital dietitians in the study of Howard<sup>17</sup> revealed that understanding the research terminology was poor, despite higher grade in school.<sup>17</sup> This disconnect between practice and knowledge may be explained by the ambiguity in the statements about research activities, such as the meaning of "systematic research," resulting to misinterpretation. If this were the case, there is need to more strongly emphasize the significance for hospital dietitians to acquire knowledge and skills necessary to increase their capacity and involvement in research.

### Limitation

Research activities were grouped according to the level in the research continuum proposed by Wylie- Rosett and colleagues<sup>29</sup>, although this procedure was not tested among the local setting. Research activities that comprised the composite research capacity score were grouped according to categories published in the literature. Thus, there were some hospital dietitians whose self-reported involvement were mostly at the base or level 1 of the continuum with fewer at the top or level 4. Despite these limitations, this study was the first attempt to measure research capacity and involvement and factors determining research activities among hospital dietitians in Metro Manila. Hospital dietitians are in a unique position to identify gaps for evidence in day-to-day practice and lead in research along areas relevant to the workplace. By actually engaging in research activities directed by practitioners themselves, the application of research findings into clinical practice has the potential to contribute to more effective patient health care. The findings from the study will provide a basis for developing a strategic development plan for building research capacity, thereby, fostering a strong research culture within dietetics, validating the role of hospital dietitians among medical and scientific communities, in general, and in patient care, in particular.

## CONCLUSIONS

The findings obtained in the present study showed the research activity/involvement and capacity of hospital dietitians in Metro Manila are dismally low. Among those involved, participation was confined to basic research activities such as using knowledge and skills in problem solving. Although dietitians consider research important and useful, few had sufficient time to do research. While the study revealed average knowledge scores among respondents, it was evident that knowledge and skills in literature search and terms used in research were low, which may have contributed to the lack of interest to conduct research in hospitals despite richness of data in the hospital setting and the favorable perception and attitude towards research. The dietitian's involvement in research was correlated with the level of education and percent of time per week dedicated to research. The significant factors that are predictive of research activity/involvement scores and research capacity scores were percent of time for research and hours per week devoted to research, respectively. Percent of time for research was significantly predictive of research knowledge of respondents. Enhancing factors can be utilized in restructuring hospital dietitians' curriculum, organizational culture and in imposing KAP of hospital dietitians in research. In doing so, the ineptly low research activity/involvement and capacity can be properly addressed.

### Recommendations

To support the development of research capacity and involvement of hospital dietitians, policy-makers and healthcare organizations should re-invent the research culture that can optimize capability- building strategies at the academic level, undergraduate hospital dietitian level and institutional level.

At the academic level, review existing local curriculum to ensure that in the undergraduate program, students actually implement a formal research curriculum, exemplifying methods in conducting research, with specific output and emphasis on writing a research protocol (literature review, formulating hypothesis, objectives, etc.), writing a research report, using computer data management system, analyzing research data, submitting ethics application, designing questionnaires, and securing research funding.

At the institutional level, ensuring that research is explicitly cited in the strategic plan and mission statement of the organization is a strategy that may foster a research culture by demonstrating that research is highly valued and integrated to the work of the dietetic service. A positive research culture includes possession of organizational structure that supports research, having dedicated research positions.<sup>46</sup> Inclusion of research training in the Human Resource Development (HRD) plan of government hospitals and institutions should be done. Research activity/involvement may be considered as basis for advancing quality of dietetic service and raising the

institution's prestige besides being a criterion for promotion and resource allocation. Research output may be a desirable prerequisite in the recruitment process. Institutions should find ways to incentivize and assist hospital dietitians to attain higher ranks by encouraging them to pursue advance degrees (masters and doctoral levels). Encouraging research culture may be promoted through in-service training programs, mentoring programs for novice hospital dietitians and policies such as reducing hospital responsibilities. Hospitals should ensure hospital dietitians put a balanced effort into hospital duties and research. This may be included in the Individual Performance Commitment and Review (IPCR) of government dietitians. It must establish criteria for pay increase, promotions and other advancement that reflect this balance. Strongly support hospital dietitians' researches through the following: allocation of funds, adopting a sabbatical policy to ensure frequent and/or extend research time, and facilitating access to research libraries, computer and other facilities. One strategy to support research is to link novice and experienced researchers. This approach may facilitate the transfer of knowledge, thereby enhancing the novice's ability to do research. Making research as part of job descriptions have been shown to enhance the culture of research. Greater recognition of research output may also motivate institutions through establishment of research registers, which can be linked with the Philippine Health Research Registry, within hospital departments.

Strategies to assist hospital dietitians intended to develop their individual skills in research may include 1) targeted Continuing Professional Education, and 2) Mentoring and providing dedicated time for research. Mentoring can speed up the learning process, identify more efficient ways of doing things and give insights into what abilities are needed and at what level. It can also help determine whether adequate performance is being achieved and whether corrective action is necessary.

Since 40% of the hospital dietitians in this study had taken post graduate courses, support for finishing their programs will help develop a culture of research through research training as well as advanced academic credentials for hospital dietitians willing to pursue terminal degrees. Allowing sabbatical and reduced duty hours after the sabbatical are some forms of incentives especially for those who will be nearing their time of retirement.

The Nutritionist-Dietitians' Association of the Philippines (NDAP) should organize a research network for hospital dietitians and establish connection with different institutions to tap resources for research; if possible, to collaborate with other organizations in the Philippines for this purpose. Extend effort for research institutes in the LGU and the regions in the conduct of clinical or nutrition research. The use of novel technologies and social media platforms to disseminate research information to dietitians is also recommended.

Although the study provided quantitative data on research capacity and involvement among hospital dietitians, use of qualitative data is recommended. Qualitative studies can provide better insights about how to promote the culture of research among hospital dietitians. For example, focus group discussions will allow information on perceptions, attitudes and knowledge surrounding research capacity within the department or organization where hospital dietitians belong, and identify issues concerning improving research capacity and involvement so these can be systematically addressed.

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### Statement of Authorship

CCT conceptualized the study, interpreted the data and drafted and finalized the manuscript. CLO helped refine the sampling frame and survey design and analyzed the data. EGF critically analyzed the manuscript, assisted in data analysis and interpretation of findings. EVM facilitated the ethics approval and processed the data and EIJ did the data collection. All authors reviewed the manuscript and approved the final version submitted for publication.

### Authors' Disclosure

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