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# Practice, Attitudes, and Knowledge toward the use of evidence-based practice among registered dietitians in Saudi Arabia

# Nawaf W. Alruwaili

Department of Community Health Sciences, College of Applied Medical Sciences, King Saud University, Riyadh, Saudi Arabia

\*Correspondence: nalruwaili@ksu.edu.sa Received 01-10-2022, Revised: 02-12-2022, Accepted: 25-12-2022 e-Published: 30-12-2022

The concern for patient safety developed evidence-based practice. The implementation of evidence-based practice in clinical nutrition is essential for the quality, safety, cost, and reimbursement of dietitians' health care services. Limited studies exist investigating evidence-based practice among registered dietitians. The study aims to explore and describe the practice, attitudes, and knowledge concerning the clinical use of evidence-based practices among registered dietitians in Saudi Arabia. A cross-sectional questionnaire was used to explore and evaluate the practice, attitudes, and knowledge of registered dietitians in Saudi Arabia. Two hundred forty-five registered dietitians were selected randomly over the period of February to Jun 2022. A total of 245 registered dietitians participated, with the most aged (25-29) years old (48%). The majority of registered dietitians worked full-time jobs (77%) with the highest proportion of 5-10 years of experience (25%), and most of them practicing in the governmental sector (53%). The knowledge questions with the highest mean score were "shared information with colleagues" (4.7  $\pm$ 2.1), and the attitudinal questions with the highest mean score were "evidence-based practice is fundamental to professional practice" (5.5  $\pm$  1.8). The highest mean score among the practice questions was "sharing of ideas and information with colleagues" (5.6  $\pm$  1.3). Registered dietitians have positive practice, attitudes, and knowledge scores towards using evidence-based practice to support decisions when providing nutritional intervention, and most favor evidence-based practice. The results of this study emphasize the need for academic intervention and continuous evaluation of evidence-based practice among registered dietitians.

Keywords: evidence-based practice; registered dietitian; practice; attitudes; knowledge

#### INTRODUCTION

Evidence-based practice (EBP) is a complicated procedure that includes several steps. These steps include representing questions that arise from clinical practice in a searchable structure, following the best evidence to address the question, and critically appraising the evidence for relevance, effect, and validity to the clinical practice question (Gordon H. Guyatt et al. 2000; Richardson 2015). After considering the clinical expertise, research evidence, and the patient's preferences and needs, the healthcare professional (HCP) decides on a course of action. The final step of the EBP process is the continual evaluation of the effect of practice (Bauer 2019; Oettinger and Zharova 2021; Richardson 2015).

EBP in health care is the principled use in making decisions about the health care provided to patients or the delivery of health services. Also, it is essential in the delivery of health services to individuals. The Academy of Nutrition and Dietetics describes evidence-based dietetics

"the process of asking questions, practice as systematically finding research evidence, and assessing its validity, applicability, and importance to food and nutrition practice decisions; to achieve positive outcomes." (Academy of Nutrition and Dietetic 2020). The primary goal of practicing evidence-based decision-making demands that HCPs be aware of integrating and evaluating the evidence. Efforts to enable the use of EBP among registered dietitians (RDs) in practice include the development of evidence-based plans and strategies (The Academy of Nutrition and Dietetics 2014), policies (Sheean et al. 2020), and instruments (Pereira et al. 2022) for use in the clinical nutrition environment. However, the implementation of EBP in clinical practice is inconsistent among RDs due to the absence of legal training, limited access to advisors, and lack of time (Byham-Gray et al. 2005). This EBP aids in assuring constant professional development at all levels of the healthcare professionals' knowledge, which is an important requirement of field

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practice (Abu-Gharbieh et al. 2015). Factors affecting the implementation of EBP still need to be more adequately comprehended (Grimshaw et al. 2004; J. M. Grimshaw et al. 2005). It has been shown that factors such as the knowledge process associated with implementing the health care providers' beliefs and attitudes, resource guidelines, constraints, evidence-based leadership support and integration of recommendations at an organizational level, collaboration, and established networks (Ploeg et al. 2007). Practice, attitudes, and knowledge (PAK) are generally examined to analyze current practices, barriers, and knowledge to evidencebased practice and determine gaps in that knowledge (Byham-Gray et al. 2005; Thomas et al. 2003).

Most studies researched EBP has focused on physicians and nurses as a target population (Knops et al. 2009). Few studies have analyzed occupational therapists' (OT), RDs', and physical therapists' (PT) use of EBP and their possible facilitators and obstacles related to the application process (Bellew et al. 2010; Bennett et al. 2003; Graham et al. 2013; Jette et al. 2003; Karlsson and Törnquist 2007; Philibert et al. 2003; Schreiber et al. 2009). RDs, OTs, speech pathologists (SPs), and PTs work as independent HCPs. They frequently function in teams with other HCPs, such as physicians, psychologists, social workers, pharmacists, and nurses. When working in hospitals, RDs, OTs, SPs, and PTs often move between clinics and patients in their work. Thus, they usually meet clients, patients, and hospital staff in other surroundings with different administrative attributes daily. Hence, this diversity of HCPs varies from physicians and nurses who frequently work independently in a clinic with nurses who often work only in one unit. Accordingly, it is impossible to generalize studies results based on physicians and nurses applying these to other health professionals. Therefore, it is important to explore factors influencing the effective implementation of EBP among various HCPs such as RDs.

There is no published data on RDs' practice, attitudes, and/or knowledge toward EBP applications or the extent to which EBP is practiced in Saudi Arabia. Nor is there any data on the frequency with which clinical practice questions that demand new knowledge arise during clinical nutrition consultations. There is no data on access to and usage of electronic databases by RDs, on the skills RDs have for exploring the critical appraisal or literature, or on the approaches available to RDs for developing the skills required for EBP in Saudi Arabia. Several barriers have been determined that might limit the application of EBP to clinical nutrition practice; however, no data has been published concerning RDs practice. The practice of EBN applies using the most beneficial available nutrition evidence, jointly with clinical experience, to help the patients by providing the optimal, most advanced nutritional intervention (Bauer 2019). The study's primary aims were to explore the RDs' PAK concerning EBP and the relationships between PAK score and demographic

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and professional characteristics. Also, to evaluate PAK and clinical use of (EBP) of Saudi Arabian RDs in working in clinical, education, and research practice areas.

## MATERIALS AND METHODS

## **Study Sample**

Two hundred forty-five RDs who are registered to practice at the Saudi Commission of Health Specialties, Saudi Arabia, who belonged to at least one of the following dietetic practices were randomly selected: Dietitians in General Clinical Practice, Clinical Nutrition Departments, Diabetes Care, and Education, Dietitians in Nutrition Support, Renal Dietitians, Nutrition Educators of Health Professionals, and Research. Only RDs who were retired were excluded from the data analysis.

#### Instruments and Procedures

The questionnaire was adapted from (Upton, Scurlock-Evans, and Upton 2016), and it has an adequate level of reliability and validity with a test-retest of between 0.8 and 0.92. Depending on the individual subscale and internal reliability ranging from 0.74 to 0.88. In terms of validity, it was reported that both the content and face validity were good. Consent forms and data were collected prior to analyses via online distribution of the questionnaire and making several visits to governmental and private sector hospitals, military hospitals, and university hospitals. It was also distributed online to all RDs affiliated with the Ministry of Health through cooperation with the nutrition department. The first section survev measured sociodemographic of the and professional characteristics such as age, gender, years of experience, place of work, type of work, working status, and membership in a scientific association. The second section of the survey measured the level of knowledge of EBP in relation to an individual patient's care in how often last year you did the following in response to a gap in your knowledge. On a visual analog scale ranging from 1 to 7, representing 1 (as frequently) and 7 (as never). Participants were asked to rate their perceived knowledge of EBP at a general level. The third section of the survey examined respondents' attitudes toward evidence-based practice to indicate where they place themselves for each of the pairs of statements on a scale of 1 to 7. Each statement requests the individual to indicate how much they agreed or disagreed. Lastly, the fourth section of the survey measured individual respondents' skills in EBP on a visual analog scale ranging from 1 (the poorest) to 7 (the best).

# **Ethical Considerations**

The study received ethical approval from the standing committee for scientific research ethics at King Saud University, reference number 22-044. All participants were informed that: the study was entirely voluntary; completing one section of the questionnaire did not obligate them to

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complete other sections; they had the right to withdraw at any time (at which point their data would be eliminated).

#### **Statistical Analysis**

Data were analyzed using SPSS vision 24. Practice, knowledge, and attitudes of evidence scales were calculated using the average of questions of each attribute, with equal weights given to each question. Mon varietal and bivariate analyses were performed with the appropriate statistical tests according to the types of study variables. Significance levels were determined for p < 0.05, with high significance at p < 0.01. PAK score was calculated by adding the scores of all the questions used in the scales after adjusting for the directionality of each question. Spearman's ( $r_s$ ) was used to measure the strength of association between two variables of interest.

#### RESULTS

# Demographic and Profession Characteristics of the Study Samples

A total of 250 participants responded to the survey; 245 participants (98%) agreed to participate and completed the survey.

Table 1: Demographic Characteristics of StudySamples

Demographic Variable		Study Sample	%
	< 25	29	12
	25 -29	117	48
	30 - 34	34	14
	35 - 39	20	8
	40 - 44	17	7
Age (years)	45 - 49	11	4
	50 - 54	10	4
	55 - 59	-	-
	> 60	7	3
	Total	245	100
	Male	95	39
Gender	Female	150	61
	Total	245	100
	Bachelor's degree	176	72
Educational level	Master's degree	59	24
	Doctoral degree	10	4
	Total	245	100
	Full time	188	77
	Part-time	9	4
Work status	Unemployed	41	17
	Volunteer	7	3
	Total	245	100

The demographic characteristics of the participants showed that the most age group of RDs is (25-29) years old (48%), with a higher proportion of females (61%) in the study. Most participants had only a bachelor's degree (72%), and the majority worked full-time jobs (77%) (Table 1).

The professional characteristics of study samples

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results showed that the highest proportion of participants has 5-10 years of experience (25%), with the majority practicing in the governmental sector (53%). Most participants are members of at least one association (65%), and the most common memberships among RDs were the Saudi Society for Clinical Nutrition membership (49%) (Table 2).

Table	2:	Professional	Characteristics	of	Study
Sample	es				-

Professio	on Variable	Study Sample	%
	0 - 1	45	18
	1 - 2	55	22
	3-4	24	10
Manual of	5 - 10	62	25
rears of	10 - 15	21	9
(voare)	15 - 20	12	5
(years)	20 - 25	11	4
	25 - 30	7	3
	Over 30	8	3
	Total	245	100
	Governmental Sector	129	53
A	Educationa I Sector	15	6
Area of	Military Sector	18	7
practice	Private Sector	72	29
	Others	4	2
	None	one 7	
	Total	245	100
	No	85	35
	Yes	160	65
	Total	245	100
Member in any Professional	Saudi Society for Clinica I Nutrition	121	49
associations	Academy of Nutrition and Dietetics	15	6
	American Society of Parenteral and Enteral Nutrition	12	5

#### Practice, Attitudes, and Knowledge of EBP

The knowledge questions with the highest mean score ( $\pm$ SD) were "shared this information with colleagues" (4.7  $\pm$ 2.1), "tracked down the relevant evidence once you have formulated the question" (4.6  $\pm$  1.9), and "integrated the evidence you have found with your expertise" (4.6  $\pm$  1.9) (Table 3).

# Table 3: Means Scores and Standard Deviations for Questions Measuring Practice, Attitudes, and Knowledge of EBP in RDs

Questions	Mean Score ± (SD)
Knowledge	
Formulated a clearly answerable question as the beginning of the process towards filling this gap	4.5 ± (1.9)
Tracked down the relevant evidence once you have formulated the question	4.6 ± (1.9)
Critically appraised, against set criteria, any literature you have discovered	4.1 ± (1.8)
Integrated the evidence you have found with your expertise	4.6 ± (1.9)
Evaluated the outcomes of your practice	$4.5 \pm (2.0)$
Shared this information with colleagues	$4.7 \pm (2.1)$
Attitude	
New evidence is so important that I make the time in my work schedule	4.3 ± (1.8)
I welcome questions on my practice	$5.0 \pm (1.8)$
Evidence-based practice is fundamental to professional practice	5.5 ± (1.8)
My practice has changed because of evidence I have found	$4.9 \pm (1.9)$
Practice	
Research skills	4.9 ± (1.5)
IT skills	5.1 ± (1.5)
Monitoring and reviewing of practice skills	5.2 ± (1.3)
Converting your information needs into a research question	4.8 ± (1.5)
Awareness of major information types and sources	5.2 ± (1.4)
Ability to identify gaps in your professional practice	5.3 ± (1.3)
Knowledge of how to retrieve evidence	5.0 ± (1.5)
Ability to analyze critically evidence against set standards	4.7 ± (1.5)
Ability to determine how valid (close to the truth) the material is	5.0 ± (1.5)
Ability to apply information to individual cases	5.3 ± (1.4)
Sharing of ideas and information with colleagues	5.6 ± (1.3)
Dissemination of new ideas about care to colleagues	5.3 ± (1.4)
Ability to review your own practice	$5.5 \pm (1.4)$

# Table 3. Means Scores and Standard Deviations for Questions Measuring Practice, Attitudes, and Knowledge of EBP in RDS

Variable			PAK score		
		n	%	Mean Score ± (SD)	
	< 25	29	11.8	117.34 ± (20.89)	
	25 -29	117	47.8	111.29 ± (19.28)	
	30 - 34	34	13.9	117.82 ± (17.78)	
	35 - 39	20	8.2	120.70 ± (32.19)	
Age (years)	40 - 44	17	6.9	123.47 ± (20.63)	
	45 - 49	11	4.5	108.36 ± (22.27)	
	50 - 54	10	4.1	101.20 ± (21.12)	
	55 - 59	-	-	-	
	> 60	7	2.9	95.290 ± (12.41)	
Condor	Male	95	38.8	112.29 ± (22.34)	
Gender	Female	150	61.2	114.31 ± (20.64)	
	Bachelor's degree	176	71.8	112.39 ± (19.98)	
Educational level	Master's degree	59	24.1	117.78 ± (24.22)	
	Doctoral degree	10	4.1	108.40 ± (24.01)	
	Full time	188	76.7	113.24 ± (21.49)	
	Part time	9	3.7	114.22 ± (26.17)	
Work status	Unemployed	41	16.7	115.22 ± (20.12)	
	Volunteer	7	2.9	110.29 ± (19.98)	
	0 - 1	45	18.4	114.49 ± (19.91)	
	1 - 2	55	22.4	113.47 ± (20.90)	
	3 - 4	24	9.8	113.50 ± (15.70)	
	5 - 10	62	23.3	114.60 ± (20.49)	
Years of experience (years)	10 - 15	21	8.6	111.43 ± (27.97)	
	15 - 20	12	4.9	128.42 ± (20.36)	
	20 - 25	11	4.5	99.820 ± (22.83)	
Γ	25 - 30	7	2.9	113.14 ± (21.82)	
	> 30	8	3.3	102.63 ± (24.41)	
	Governmental Sector	129	52.7	111.49 ± (21.99)	
	Educational Sector	15	6.1	119.93 ± (25.13)	
Area of practice	Military Sector	18	7.3	113.00 ± (20.33)	
	Private Sector	72	29.4	115.39 ± (19.90)	
	Others	4	1.6	133.00 ± (17.45)	
ſ	None	7	2.9	108.43 ± (11.25)	
Member in any	Yes	160	65.3	114.44 ± (23.17)	
professional associations	No	85	34.7	111.80 ± (17.21)	

The lowest levels of knowledge (mean score  $\pm$  SD) were "critically appraised, against set criteria, any literature you have discovered" (4.1  $\pm$  1.8).

The attitudinal questions with the highest mean score  $(\pm SD)$  were "evidence-based practice is fundamental to professional practice"  $(5.5 \pm 1.8)$ , "I welcome questions on my practice"  $(5.0 \pm 1.8)$ , and "my practice has changed because of evidence I have found"  $(4.9 \pm 1.9)$  (Table 3). Those with the lowest mean score were "new evidence is so important that I make the time in my work schedule"  $(4.3 \pm 1.8)$ .

Among the practice questions, the questions with the highest mean score ( $\pm$ SD) were "sharing of ideas and information with colleagues" (5.6 ± 1.3), "ability to review your own practice" (5.5 ± 1.4), "ability to identify gaps in your professional practice" (5.3 ± 1.3), "ability to apply information to individual cases" (5.3 ± 1.4), and "dissemination of new ideas about care to colleagues" (5.3 ± 1.4) (Table 3). The practice questions with the lowest mean score were "Ability to analyze critically evidence against set standards" (4.7 ± 1.5) and "Converting your information needs into a research question" (4.8 ± 1.5).

Table 4 shows that RDs aged 35-39 years (8.2%) scored higher PAK (120.70±32.19) than RDs (2.9%) in the > 60 years age group (95.29±12.41). Females' RDs (61.2%) scored higher PAK (114.31±20.64) than males' RDs (38.8%) (112.29±22.34). On the educational level, RDs working on their master's degrees (24.1%) scored higher PAK than their counterparts (117.78±24.22). Unemployed RDs (16.7%) scored the highest PAK among all other groups (115.22±20.12). RDs with 15-20 years of experience (4.9%) scored the highest PAK among all other groups (128.42±20.36). For the area of practice, RDs who practice in the educational sector (6.1%) scored the highest PAK among all other groups (119.93±25.13). Lastly, the association memberships (65.3%) scored a high PAK (114.44±23.17) compared to RDs who are not members (34.7%) of any professional associations.

The correlation coefficient was analyzed between the major practice, knowledge, and attitudes variables (Table 5).

Table	5:	Correlation	Between	Practice,	Knowledge,
and At	titu	Ide			

Variables	rs	P-value
Practice & knowledge	0.203 *	<i>p</i> < 0.001
Practice & attitude	0.294 *	<i>p</i> < 0.001
Knowledge & attitude	0.486 *	<i>p</i> < 0.001

\* Highly statistically significant association at p < 0.01

A strong positive correlation was observed between practice and knowledge, and this result appeared to be highly significant ( $r_s = 0.203$ ; p < 0.01). Also, a strong positive correlation between practice and attitudes appeared to be highly significant ( $r_s = 0.294$ ; p < 0.01). Moreover, a highly significant positive correlation was seen between knowledge and attitudes ( $r_s = 0.486$ ; p < 0.01).

0.01).

# DISCUSSION

This descriptive, cross-sectional study revealed that the tested variables could not predict the RDs' PAK of EBP. The strongest predictors for the PAK score were among the area of practice: the educational sector and association memberships being highly predictive. RDs with master's degrees, those who worked as researchers or faculty members in the dietetics field, those who tracked down the relevant evidence and integrated the evidence into the expertise, those who shared ideas and information with colleagues, and those who were members of at least one professional association had higher PAK. Also, RDs who can retrieve evidence, identify gaps in their professional practice, review their own practice, welcome questions on their practice, and believe EBP is fundamental to professional practice had higher PAK scores. The work status, educational level, and years of experience were less predictive of the PAK score. In a study by (Beasley and Woolley 2002) the same predictors about knowledge and skills for evidence-based medicine were observed among physicians (e.g., area of practice and research skills and experience). Although, another study reported similarities in their findings, such as practicing in the educational sector and being members of at least two professional associations (Byham-Gray et al. 2005). A high level of education was not associated with a higher PAK score. For example, those with a master's degree scored higher PAK than RDs with bachelors and doctoral degrees. In contrast, it was reported that allied healthcare professionals did research more positively if they had earned a doctoral degree (Waller et al. 1988). Furthermore, a study conducted to measure the dietitian's perception, attitudes, and knowledge found that RDs with higher levels of education (Beasley and Woolley 2002).

A high level of research skills was found to predict high PAK towards EBP. In their graduate education, healthcare professionals who had completed a research study did better. It was reported that those physicians who were educated regarding research and experienced in practice-based research were more optimistic in their perceptions of EBP (A. et al. 1998; G H Guyatt et al. 2000). Also, another study found that adequate access to databases and resources support the RDs towards the use of EBP (Vogt, Byham-Gray, and Touger-Decker 2013). These findings aligned with another study that reported the valuable benefits of having access to at least one database (Heiwe et al. 2011). In addition, a crosssectional survey studying the pediatric dietitian's' knowledge and the use of EBP found that 65% of RDs had access to other sources of the database rather than what had been provided by their employer (Thomas et al. 2003). The types of access vary from subscribing to scientific journals with access to relevant EBP to using smartphones for searching information related to providing nutritional interventions (Demiris et al. 2008; Jang and

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Song 2007). It was reported that the lack of access to databases and information relevant to the care provided did not seem to be the basis for the irregular use of EBP resources and lack of foundation for the clinical practice. The weak implementation might be related to specific barriers. The major barriers recognized in the findings were a lack of formal training in critical appraisal, lack of access to supervisors, and lack of time (Vogt et al. 2016). Another barrier to the implementation of EBP in the area of clinical practice was reported in several studies to be the lack of organizational support (Brown et al. 2009; Cadmus et al. 2008; Jette et al. 2003; Thomas et al. 2003). Also, another direct barrier to the use of EBP in the dietetics field was the lack of time (Bartelt et al. 2011; Byham-Gray et al. 2005; Gale and Schaffer 2009; Heiwe et al. 2011; Jette et al. 2003; Koehn and Lehman 2008; Sackett 1994; Satya-Murti 2002).

Comparing the mean scores of PAK with data from previous studies shows more positive practice and attitudes (Byham-Gray et al. 2005; Hinrichs 2018; Vogt et al. 2013). These improvements might be due to the curriculum development by making EBP a requirement approach in assessing the nutrition status for the bachelor's and master's degrees. These improvements might be due to the curriculum development in recent years by making EBP a requirement approach in assessing the nutrition status for bachelor's and master's studies. The culture towards using EBP among RDs in clinical practice may need national regulations, training, and education on EBP. Although the importance of critical appraisal among RDs regularly while committing to saving time for EBP in clinical practice and providing research supervisors.

# CONCLUSION

This study delivered information and data about RDs in Saudi Arabia and their practice, attitudes, and knowledge toward using of EBP in their clinical practice. RDs have positive practice, attitudes, and knowledge scores towards the use of EBP to support the decisions when assessing the nutrition status and providing nutritional intervention and most of the RDs favored to the use of EBP in their practice. It is recommended that the authority who regulates the clinical practice may support the increased use of EBP among RDs especially in the area of practice to integrate the principle of EBP and the research findings into the clinical nutrition practice.

The results of this study emphasize the need for academic intervention and continuous evaluation of EBP among the RDs. Future studies should examine such an intervention's impact to improve the use of the best EBP in clinical nutrition decisions toward providing health care.

# CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

#### Practice, Attitudes, and Knowledge Toward the Use of EBP ACKNOWLEDGEMENT

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## AUTHOR CONTRIBUTIONS

NWA designed, performed the study, wrote and reviewed the manuscript. The author read and approved the final version.

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