



7

**RESEARCH STATUS AND PROFILE
OF THE SECOND DIDACTIC
DIETETICS PROGRAMME IN
SAUDI ARABIA: A RESPONSE FROM
A DIASPORA OF GRADUATES****ELHAM ALJAALY**

King Abdulaziz University
the Clinical Nutrition Department, Faculty of Applied
Medical Sciences, Jeddah, Saudi Arabia.
PO Box: 54539 Jeddah 21524.
Email: ealjaaly@kau.edu.sa / aljaalydiet@gmail.com

ABSTRACT

PURPOSE: To measure the quality and quantity of practice used in relation to research for students and faculty members of the second established Saudi Dietetic programme at King Abdulaziz University (KAU).

DESIGN/METHODS: The quantity, type and approaches used in conducting research in the KAU dietetic programme were measured and identified considering major components in defining criteria of quantity, quality, funds, research awards, data collection and reports concerning faculty and students' participation in research. A feedback survey based on alumni students was also conducted.

FINDINGS: The applied nutrition research based on final year research projects was mainly related to clinical dietetics and practice (62%). Other research was related to public health, management or other taught sciences. The results of the conducted alumni feedback survey (responses = 33 out 188 graduates) showed that only 65.6% of students had adequate budget and facilities provided for their research projects. About 29% (n = 4 out of 29) of the graduates carried out joint research projects; not all contributions were appropriately acknowledged. Only 19% of students had their research published in peer-reviewed journals, and 53% thought that their study and research training period of the programme prepared them well to undertake research. Few respondents (32%) were currently involved in research that was related to their postgraduate studies, and 53% of graduates were

continuing their education in countries such as Canada, the USA and the United Kingdom; the rest were continuing their studies in Saudi Arabia. This diversity in postgraduate education in dietetics will enrich research in the department.

PRACTICAL IMPLICATIONS: The study will help dietetic programme administrators to develop and implement a strategic plan for research activities within international standards.

ORIGINALITY/VALUE: This is the first study to measure the quantity and quality of research in a Saudi dietetic programme using different approaches, including a feedback survey from students, advisory and graduates of the CLN Programme.

KEYWORDS: Research, Diaspora, Graduates, Alumni, Saudi, Clinical Nutrition/ Dietetics, KPIs, higher Education.

BACKGROUND AND AIMS

The definition of dietitian, standards for the schooling of dietitians, a code of ethics and good practice in nutrition and dietetics were created and confirmed earlier by the International Confederation of Dietetic Associations (ICDA) (MacLellan, 2010).

To effectively implement evidence-based practice, any health professional must primarily understand research methodology. This is in order to enable an informed appraisal of applicable evidence. However, not all health specialists are involved in research (Stephens *et al.*, 2009). Like other health specialists, nutrition and dietetic professionals are increasingly working within an evidence-based practice pattern to support the provision of safe and quality care for their patients. Statements to ground dietetic practice in evidence were generated by ICDA: this was to develop practice that is based on evidence. Statements that were shaped in interpreting, applying and participating in research to enhance practice were also shaped via ICDA. Others moulded for the competency when applying the knowledge of nutrition and dietetics integrated it with other disciplines in health. Importantly, statements on the systematic evaluation and revision of the quality of practice based on feedback from professionals were also formed. Moreover, the provision of dietetic services grounded in the expectation and needs of the community or client was attributed to the ICDA (MacLellan, 2010).

Although nutrition and dietetics is a profession that is concerned with the prevention and treatment of nutrition related diseases that are individually or community-based, earlier efforts have shown the dearth of involvement of dietitians in research (Slawson *et al.*, 2013). The lack of participation in research, particularly among faculty members, was explained by a number of factors that had an impact on this type of contribution. These factors included size and structure of the institution and/or department, and research attitude. Other factors are related to the academic members' activities and include faculty roles in the undertaken research,

the time allocated for teaching and training responsibilities, and the available grants for research in areas related to nutrition. Other factors are based on individuals and include self-motivation in conducting a research (Whelan and Markless, 2012).

The development of research abilities for many dietetics professions in many countries begins in undergraduate education, which requires effective research teaching and learning approaches. Thus far there is limited evidence concerning operative research teaching and learning methods. Previous suggestions in the teaching and learning process in research concerning the field of nutrition and dietetics confirmed that hands on, real life, and self-determining research experiences are appreciated by students (Whelan *et al.*, 2007). The King Abdulaziz University (KAU) undergraduate degree programme in nutrition and dietetics has defined the value of research to individuals and society by incorporating research in its mission “Community responsibility, Knowledge development, Research, Innovation and Entrepreneurship in Nutrition & Dietetics”. Research is a specific requirement for the KAU degree in dietetics (CLN mission/objectives/goals, 2016).

The primary programme’s goal in research and research training is to “*develop and sustain a well-qualified programme with high level of commitment for excellence in nutrition & dietetics education which promote research and innovation*” (CLN mission/objectives/goals, 2016).

There are two dimensions to this goal: firstly, the programme is dedicated to the development and sustainability of a high-quality programme through the achievement of high-quality research and research training at an international standard. This could be achieved across the whole spectrum of its disciplines and to the development of special research concentrations in the field of nutrition and dietetics. Goals in research could be measured by a number of Key Performance Indicators (KPIs)¹, such as research funding, refereed publications and extra-departmental research partnerships. In accordance with Parmenter (2010) “key performance indicators (KPI) represent a set of measures focusing on those aspects of organizational performance that are the most critical for the current and future success of the organization”. A quote on measurement by Lord Kelvin in 1883 states,

“When you can measure what you are speaking about, and express it in numbers, you know something about it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts advanced to the stage of science” (Zapato, 2008).

¹ Performance indicators are specific pieces of evidence that are normally pre-selected and used consistently over time so progress can be assessed and comparisons made with past performance, with other departments, colleges or sections within an institution, or between institutions (NCAA, 2015).

Every KPI measure should include several components, such as the definite results of the indicator, the goal for which the indicator is determined, the dissimilarity between genuine results and goal results, and indication values, or benchmarks” (Lyddon and McComb, 2008). For educational institutions, determining their KPI should include all of these components.

The Saudi National Commission for Academic Accreditation & Assessment (NCAAA) claims that any Saudi institution with the title “university” should meet the standard for research. In addition, teaching staff must have continuing involvement in scholarly activities in their field of study (NCAAA, 2009). Higher education accreditation was defined earlier by Lenn (1992) as “a type of quality assurance process under which services and operations of post-secondary educational institutions or programmes are evaluated by an external body to determine if applicable standards are met” (Lenn, 1992). The NCAAA agency grants accreditation status for higher education programmes such as nutrition and dietetics when eleven standards are met. The standards are developed based on the international identification for good practice in higher education, which was adapted and modified to the requirements of higher education in Saudi Arabia. The NCAAA’s eleven standards are related to:

- mission;
- goals and objectives;
- governance and administration;
- management of quality assurance and improvement;
- learning and teaching;
- student administration and support services;
- learning resources, facilities and equipment;
- financial planning and management;
- employment processes;
- research; and
- institutional relationships with the community.

A higher education institution/programme is also required to provide evidence of good quality performance in relation to all eleven standards. The NCAAA has provided higher education programmes with a list of KPIs. The list is preferable to consider KPIs for each standard when conducting a self-evaluation of the programme. The KPIs are provided as guiding principles for evolving evidence to upkeep that a given standard is met. With relation to research standards, and as per NCAAA suggestions, the KAU CLN programme use KPIs to measure accomplishments in research and decide what needs to be changed. The programme’s research profile uses KPIs such as numbers and proportions of

annual publications. Citations in refereed journals and papers or reports presented at academic conferences for teaching staff are also indications for success in research. The research funds allocated to the programme are also used to measure attainment in research. Other indicators include staff satisfaction and their retention and promotion (Programme specification for the academic year 2015-2016: Personal communication by the head of department/coordinator of students' research projects).

As called for by one of its goals, and similar to the international nutrition and dietetics programmes, the KAU CLN programme identifies the need to maintain a relationship that *sustains the drive for life-long learning, support alumni units should be considered*. The alumni students could help in providing their department with advice and support (Catherwood, 2013). They could also enhance the programme's learning experience and provide a formal system for networking, which could foster and encourage ethics and research in the field of nutrition and dietetics. The KAU CLN programme supports alumni and maintains a relationship that sustains the drive for life-long learning (CLN mission/objectives/goals, 2016).

Founded in the International Confederation of Dietetic Associations (ICDA) report in 2008, countries who are members of the ICDA have a need for dietitians to complete maintenance training after finishing the basic education programme. Maintenance training will possibly cover research as part of continuous education. Evidence on dietitians' participation in research, audit and evaluation of understanding and attitudes towards these activities was previously considered (Harrison *et al.*, 2001).

The author has recognized the need to survey and measure the quality of research using indications for KAU CLN research profiles by measuring the number/type of publications and citations in ranked journals, with and without high impact factors, and those that are professionally and academically related. Satisfaction about the quality of KAU CLN conducted research was also measured through feedback surveys from students, academic staff, external examiners for students' research projects, the advisory committee and alumni students.

The purpose of this study is to assess the research status and profile of the second Saudi nutrition and dietetics programme in Jeddah city, Saudi Arabia, and to investigate the involvement of a diaspora of graduate dietitians in research and audit. The study will also assess graduates' understanding and attitudes in the direction of these activities.

The survey could help dietetic programme administrators to develop and implement a strategic plan in research activities that is comparable to other international programmes. The quality of research activities can also be monitored and evaluated using different performance indicators, including feedback surveys and internal and external benchmarking suitable for higher education. It is a call for a diaspora of Saudi researchers in the field of nutrition and dietetics working in different geographical locations in the world, to ensure research quality for the CLN

programme by providing their experience and support to the teaching and learning process and practice of research. Consequently this will help in supporting future efforts to reduce the skills gap, and to establish and sustain a national/regional structure in research in a convergent way.

DESIGN/METHODS

The quantity, type and approaches used in conducting research in the KAU dietetic programme was measured and identified by considering major components and indicators in defining criteria of quantity, quality, funds, research awards, data and reports about faculty and students' participation in research were collected (programme-based data). Data also included feedback surveys from senior students, the CLN advisory committee, and external examiners for students' research projects.

The KAU's Assessment and Evaluation Administration through the Ensure the Quality of University Performance Program (EQUAP) (Assessment and Evaluation Administration, 2016), provides a link to a survey instrument concerning all taught courses and for all students. The Online Student Satisfaction Survey was distributed to each student who took the research projects course (n= 20 students). The students completed the survey through the online electronic system ODUS PLUS² during the last 4 weeks of the 15-week term session, in the academic year 2014-2015. The feedback survey from the external examiners (n=2 examiners) was conducted after the seminar time (in the academic year 2014-2015) where students presented their research projects. A feedback survey from the KAU CLN Advisory Committee (n=8 members) was conducted in the academic year 2015-2016.

In addition, feedback surveys were designed and completed by graduates using an email questionnaire. The email questionnaire was used to investigate graduate dietitians' research status, knowledge, attitude towards research and involvement in research, either inside and/or outside the Kingdom of Saudi Arabia (KSA).

The questionnaire was designed to include surveys about the conducted research and the effectiveness of the studied programme on this type of practice. The self-efficacy perceptions, opinion, experience and continuous practice in the area of research for this dietetic profession was also considered.

The Statistical Package for the Social Sciences (SPSS) was employed; descriptive analysis was used to examine research questions. Descriptive statistics such as the mean and standard deviation explaining the overall status regarding research conducted through the CLN programme was considered.

² International system developed through the activities and current electronic systems of KAU (ODUS). http://odusplus-info.kau.edu.sa/Default.aspx?Site_ID=223800&lng=EN

RESULTS

The present study assesses evidence on the KAU dietetic programme's research status and profile. Results are based on data that were collected from the programme administrators, such as programme specification and reports, data on research conducted by teaching staff and students. Other results were based on feedback surveys from stakeholders including students, alumni, examiners and members of the CLN advisory committee.

TEACHING AND TRAINING IN RESEARCH FOR CLN UNDERGRADUATE STUDENTS

To be qualified for a BSc in nutrition and dietetics, it is compulsory for senior students (all female) to conduct and submit a research project report. The duration of the KAU research project is 30 weeks; essentially, it aims to prepare students to be able to plan and implement an independent nutrition research project in the area of nutrition and dietetics and to present and discuss its findings. Students complete one of several different types of research projects: 1) experimental; 2) clinical study, which could be original or in conjunction with a large, ongoing research study; 3) nutrition and dietetic services/practice; community-based). All research should relate to the nutrition and dietetics field. Conducted research belongs to a senior-level course entitled "Student Research Projects" with the code and number (CLN 499). The credit hours for the course are two credit hours out of 137 hours for the whole programme, which should be completed in a time frame of four years. To allow students to conduct research, they should successfully complete all courses for the third year.

Students also have to study a course entitled "Research Methods in Health Sciences" (Code #: CLN 422) while conducting their research project. This is to allow students to understand and use the appropriate research methods. In their research projects, students are engaged in actual investigations and work in a supervised manner. They are divided into groups of more than two persons in the group.

After submitting the final report, students present their work in a seminar day that is scheduled by the department at the end of the academic year. Internal examiners, who are faculty members of the CLN programme, and external examiners, who are either KAU and/or Non-KAU faculty members, are invited to attend the seminar and assess the presented work for students. Faculty of Applied Medical Sciences (FAMS) administrators (the Dean, Vice-deans) and clinicians are invited to attend the seminar day and take part in the discussion about the projects'. Family are also invited to attend the seminar day.

A mock *viva voce* is conducted by members of the academic and scientific committee to evaluate students' work one month before submitting final reports. This is in order to evaluate students' engagement and work throughout the project, and their ability to present and defend their work to an audience and examiners.

The programme has good facilities and equipment such as laboratories that could support students in their research projects. However, adequate funds and support is not available for all research activities.

Looking at the publication status for the teaching staff and graduation research projects, a total of more than 60 research projects have been conducted by CLN programme students since the programme was established. Titles and type of some student research projects are presented in Table 1. Approximately 23% (n=14) of the conducted work was published in scientific journals, however, not all data related to the published work are available in the department. Almost 55 articles have been published by CLN faculty members since the programme was established. Work belongs either solely to faculty or is related to students' projects. However, full data are not available to be presented in this study.

Table 1: Students Research Projects (final year projects) - examples of projects from the academic year (2008-2009 to 2015-2016).

Public Health Nutrition		
No.		Academic year
1.	Saudi school meal study (SSMA): A cross sectional study that assess the impact of nutritional quality of school meals on children nutritional status and health	2014- 2015
2.	Prevalence of pre-hypertension among students in faculty of Applied Medical Sciences aged between 19-25	2014- 2015
3.	Assessing of KAU female section's physical environment, food and beverages options served by different caterers	2013- 2014
4.	Obesity and Vitamin D King AbdulAziz University, Jeddah	2013- 2014
5.	Biological age associated with nutritional Status and Life style Across Healthy Population Residing in Jeddah between Ages 19 – 65	2013- 2014
6.	Lifestyle factors associated with overweight and obesity among university students in Jeddah.	2012- 2013
7.	Nutritional Status of medical student females, King Abdulaziz University, Jeddah	2012- 2013
8.	Intelligence Quotient In Relation To Nutritional State and Food Intake of High School Students in Jeddah Life Science Journal	2012- 2013
9.	Studying the differences in food patterns and lifestyle among health college students and their mothers in Jeddah, Saudi Arabia	2012- 2013
10.	Nutritional Status by measurement the sensitivity and specificity for some of nutritional indicators for colorectal cancer patient before and after different modulates of treatment	2012- 2013

Table 1 (Continued)

No.		Academic year
11.	Demographic and factors that affect the level of food consumption of women prisoners in Jeddah	2011- 2012
12.	Intelligence quotient in relation to nutritional state, food intake and physical activity of high school students in Jeddah	2011- 2012
13.	Bone Health Status among Applied Medical Sciences Female Students at King Abdulaziz University, Jeddah	2011- 2012
14.	Nutritional status, food intake and physical activity in preschool children.	2010- 2011
15.	A Study of nutritional status of pregnant women in King Abdulaziz University Hospital in Jeddah.	2009-2010
16.	Effect of food price rice on general health status of some poor family in Jeddah city	2008- 2009
	Eating Behaviors among adolescents at middle schools in Jeddah.	2008- 2009
Clinical dietetics (e.g. Nutrition & Dietetic Practices & Services Evaluation)/ Health and Disease & Applied Nutrition Science		
17.	Assessment of dietetic practice, nutritional services and patient satisfaction with scope of chronic kidney disease in Jeddah city.	2014- 2015
18.	Prevalence of pre-hypertension among students in faculty of Applied Medical Sciences aged between 19-25	2014- 2015
19.	Nutritional status in patients with chronic heart failure.	2014- 2015
20.	Study the Impact of Garlic (<i>Allium sativum</i>), Nutmeg (<i>Myristicafragrans</i>) and Rosemary (<i>Rosmarinusofficinalis</i>) on Hyperchlosterolmic Rats. 2014	2014- 2015
21.	Nutritional status among patients with cardiovascular disease	2014- 2015
22.	Hepatoprotective effect of turmeric and thyme on oxidative stress against CCL4 induced liver injury in rats	2014- 2015
23.	Effect of herbal extract (green tea, mint and sage) on obesity induced by high fat diet in rats 2014	2014- 2015
24.	A comparison of dietary intake with (rda) for colorectal cancer patient before and after different modulates of treatment.	2013- 2014
25.	Nutritional status of women with genital tumors	2013- 2014
26.	Relationship between Vitamin D Deficiency and Arrhythmia. 1434-1435	2013- 2014
27.	Knowledge, attitude, and behavior of young women towards dietary calcium intake.	2013- 2014

Table 1 (Continued)

Clinical dietetics (e.g. Nutrition & Dietetic Practices & Services Evaluation)/ Health and Disease & Applied Nutrition Science		
No.		Academic year
28.	Effect of Antioxidant on Rats Fed Thermally Oxidized Oil (Frying Oil)	2013- 2014
29.	Effect of vitamins and minerals' supplementation on mammographic breast density.	2012- 2013
30.	Factors associated with dietary supplement use among gym attendees in Jeddah, KSA.	2012- 2013
31.	Criteria of breastfeeding in association with intelligence quotient (IQ) score in preschool children.	2012- 2013
32.	Dairy products and the metabolic syndrome.	2012- 2013
33.	Nutritional Status of medical student females, King Abdulaziz University, Jeddah.	2012- 2013
34.	The Effect of Phytoestrogen as a natural selective estrogen receptor modulator (SERM) on breast cancer prevention.	2011- 2012
30.	Factors associated with dietary supplement use among gym attendees in Jeddah, KSA.	2012- 2013
31.	Criteria of breastfeeding in association with intelligence quotient (IQ) score in preschool children.	2012- 2013
32.	Dairy products and the metabolic syndrome.	2012- 2013
33.	Nutritional Status of medical student females, King Abdulaziz University, Jeddah.	2012- 2013
34.	The Effect of Phytoestrogen as a natural selective estrogen receptor modulator (SERM) on breast cancer prevention.	2011- 2012
35.	The Nutritional status in patients with colorectal cancer pre and post different modulates of treatment	2011- 2012
36.	Dietary glycemic load association with premenstrual symptoms in adolescent girls.	2011- 2012
37.	Malnutrition and dietary intake of colorectal cancer patients before and after surgery, or other treatments.	2011- 2012
38.	Bone Health Status among applied medical sciences female students at king Abdulaziz university, Jeddah	2011- 2012
39.	The effect of blood sugar levels, measured by glycemic index, on acne vulgaris in adolescents	2010- 2011
40.	Effect of (OMEGA-3) natural sources food intake on Post-Laser In Situ Keratomileusis (LASIK) Tear Dysfunction Syndrome	2010- 2011

Table 1 (Continued)

Clinical dietetics (e.g. Nutrition & Dietetic Practices & Services Evaluation)/ Health and Disease & Applied Nutrition Science		
No.		Academic year
41.	The effect of soy supplement on manifestations accompanying per menopause. 2009.	2010- 2011
42.	Can dietary fiber intake affect the age at menarche?	2010- 2011
43.	Attention deficit hyperactivity disorder (ADHD) and the effects of artificial food coloring on children	2009- 2010
44.	Effects of flaxseed as a food naturally rich in n-3 polyunsaturated fatty acids (PUFA) on rheumatoid arthritis (RA)	2009- 2010
45.	Effect of diet on drug addict people	2008- 2009
46.	Can nutrition and diet affect your baby's gender	2008- 2009
47.	Can a bulb of garlic a day keeps breast cancer away?	2008- 2009
48.	Nutrition status of some children and adolescents with down syndrome in Jeddah	2008- 2009

Source: Devised by author (the Head of the Clinical Nutrition Department)

As per NCAAA requirements, the programme has chosen “the number of refereed publications for teaching staff in the previous year per full time equivalent member of teaching staff as one of the KPIs to assess research status” (NCAAA, 2015). Conference presentations were excluded for this assessment (Table 2). The ratio for refereed publications in the previous year per full time equivalent member of teaching staff was 9:10, compared to 4:10 in the previous year. However, on two members of faculty published nine papers, where three published works are classified as ISI publication. Consequently, a new target benchmark is required that all the staff members must publish a minimum of one paper per year.

The ratio for papers or reports presented at academic conferences during the past year per full time equivalent members of teaching staff was 10:10, compared to 4:10 in the previous year. However, participation was also limited to one or two faculty members. Accordingly, fairly good participation was noted (Table 2).

Table 2: Programme KPIs and Assessment using research (NCAAAA)

KPI #	List of Program KPIs Approved by the Institution	KPI Target Benchmark	KPI Actual Benchmark (2014-2015)	KPI Internal Benchmarks (2013-2014)	KPI External Benchmarks	KPI Analysis	KPI New Target Benchmark
Standard for Research							
1	Number of refereed publications in the previous year per full time equivalent member of teaching staff. Publications based on the formula in the Higher Council Bylaw excluding conference presentations	10:10 Minimum one publication/ each staff)	9:10 Based on data for the academic year (2014-2015)	4:10 Based on data for the academic year (2013-2014)	No external benchmark was conducted or used to compare with.	Two faculty members had nine research papers published, and three of the published works are classified as ISI publication	9:9 More than one paper for one faculty
2	Number of papers or reports presented at academic conferences during the past year per full time equivalent members of teaching staff	10:10	10:10	Number of papers or reports presented at academic conferences during the past year per full time equivalent members of teaching staff	10:10	10:10	Number of papers or reports presented at academic conferences during the past year per full time equivalent members of teaching staff

Source: Devised by author (the Head of the Clinical Nutrition Department)

THE ONLINE STUDENT SATISFACTION SURVEY

Survey completers (70%, n= 14) among the CLN students who completed the course “Students research Project” consisted of 20 female students in the academic year 2014-2105. The students overall satisfaction with the course was “satisfied”, which rated as 3.72 out 5.00. Response was mainly on quantitative questions. However, no response was reported on any of the qualitative questions, e.g. “What did you like/dislike most about this course?” or “What suggestions do you have to improve this course?”, Survey questions 1-29 measured student’s satisfaction about items: 1. the start of the course, 2. what happened during the course, 3. evaluation of the course, and 4. overall evaluation of the course.

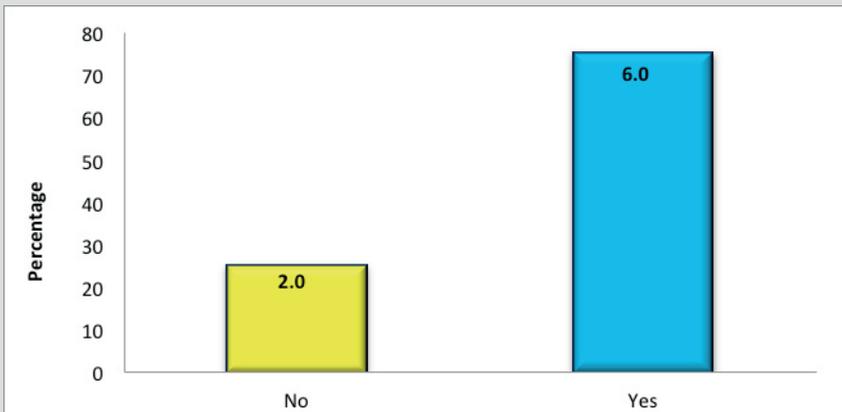
FEEDBACK SURVEYS FROM THE EXTERNAL EXAMINERS (ACADEMIC YEARS 2014-2015)

The department used feedback surveys to evaluate competency in research in comparison to other health departments’ standards. The evaluation concerned knowledge, skills and attitudes in research and its performance. Starting from the academic year 2013-2014, the head of the programme started involving external examiners from other health departments/faculties and from inside or outside the KAU: examiners were academics with a clinical background. The survey was conducted in the academic year 2015-2016, seeking the feedback for two examiners who were medical doctors and clinical dietitians who are involved with research teaching and training. The survey considered questions to rate students’ research knowledge, skills and awareness; rating students’ ability and confidence in presenting their work, in taking questions raised by audience was also included. Rating supervisors’ capabilities in guiding research projects and helping students in selecting their research topics was also included. In general, examiners’ rating for students’ work and supervisors’ guidance ranged from good to excellent. They were both impressed and interested about all presented work, and noticed the spirit of the teams’ hard work and dedication among all presenting groups. The examiners recommended research areas to be included, such as research about the awareness of a healthy life style in Saudi society and compare this regionally and internationally. One suggested that an area of research to be considered by the nutrition department was in genetics and epigenetics.

ADVISORY MEMBERS’ FEEDBACK SURVEY

The advisory CLN members were asked (n=8), “Do you think that the programme provides professional development with regards to knowledge and applications of research and other methods of development, such as allowing staff to attend national/international conferences and workshops”. After they went through all reports and documents in the department, and from their own observation, of those who responded to the question, 75% responded positively (Figure 1).

Figure 1: Perception of advisory committee about CLN research knowledge and applications



Source: Devised by author

GRADUATES FEEDBACK SURVEY

A total of 188 students graduated from the KAU CLN programme between academic years 2008-2009 to 2014-2015: the average number of graduates each academic year was 27. The survey concerning research status and profile was sent to all graduates using an email questionnaire, and contact was received from the FAMS academic affairs. A response rate of 18% (n=33) was achieved. There was a greater response from graduates in the academic field (52%), particularly those employed by the CLN department. The non-existence of updated contact details (available from the academic records during the period of study) was noticed and a number of emails failed to reach graduates; this affected the response rate. No appropriate activated alumni unit that is FAMS or CLN-based was available to reach all graduates. However, although there was only an 18% response rate from the graduates, the survey provided the first comprehensive set of feedback data in research status and profile available to date by the CLN alumni students.

Graduates included in this survey (Table 3) were all those who completed their clinical placement (between academic years 2008-2009 to 2014-2015).

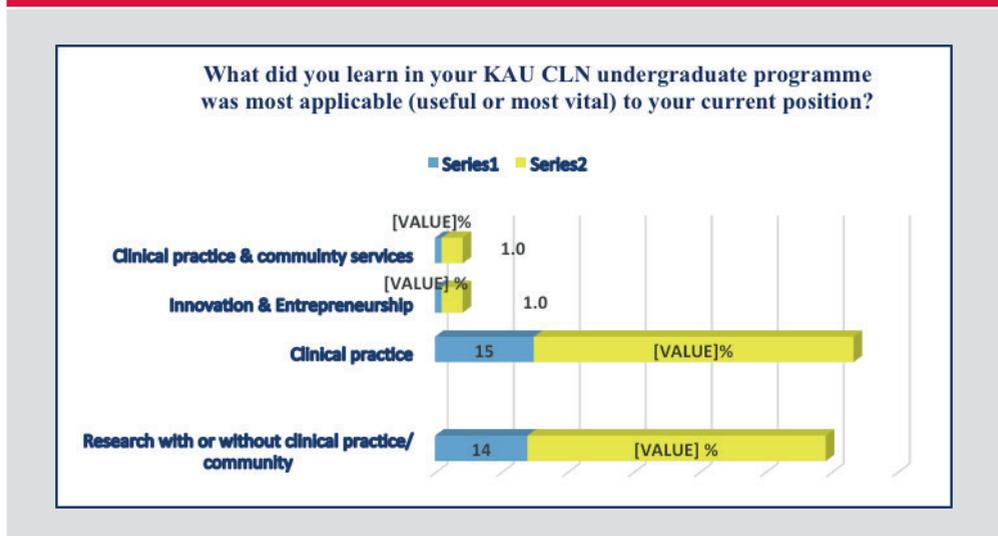
Table 3: Number of graduates based on each academic year

Graduation Year	Number of Graduates
2008 - 2009	31 students
2009 - 2010	34 students
2010 - 2011	31 students
2011 - 2012	19 students
2012 - 2013	21 students
2013 - 2014	24 students
2014 - 2015	28 students

Source: Devised by author (the Head of the Clinical Nutrition Department)

Graduates reported that clinical practice (48%) was the most studied course while with the KAU CLN undergraduate programme, followed by research (45%) (see Figure 2).

Figure 2: Most applicable learned by graduates in their current position



Source: Devised by author

Students' research projects were mostly undertaken in the health and disease areas (66.7 %) (see Figure 3).

Figure 3: Research area for the conducted students' research projects



Source: Devised by author

The different types of research projects conducted by the students were empirical (36.4%), descriptive (33.3%), or observational (30.3%). These projects were mostly not financially funded (65.6%), and graduates also reported that budgets and facilities were not adequately provided for their conducted research.

For the question “please specify the method used to fund/equip your research?”, 24.2% (n=8 out of 33) stated that they were self-funded. Nine of the graduates (29%) reported that they were involved in joint research projects and their contribution (4 out of 29) was appropriately acknowledged.

About 32% of participants are currently involved with work that is related to postgraduate studies, and 53% of graduates are continuing their education in countries such as Canada (two graduates), the USA (four graduates), the UK (four graduates), and the rest in Saudi Arabia.

Responses to other questions concerning graduates' research publications, audit and further involvement in research are presented in Table 4.

Table 4: Response to surveys concerning publication, research, audit and further involvement in research

Survey question	No	Yes
Was your CLN graduation research project published?	25 (80.6)	6 (19.4)
If yes, was the journal related to the Filed/profession??	1 (33.3)	2 (66.7)
If yes, in which type of Journals was published? Peer-reviewed Journal Non-peer-reviewed Journal	31 (93.9)	2 (6.1)
Do you think that your CLN training programme prepared you well to undertake research?(n= 33)	15 (47)	17 (53)
Based on your understanding of the terms 'research' and 'audit', do you think that the two terms have different meaning?	9 (27.3)	23 (69.7)
Do you think that audit is an important part of your role as a dietitian?	8 (24.2)	22 (66.7)
Are you pleased about your further involvement in research and audit after graduation?	14 (46.7)	16 (53.3)
Do you think that your CLN training programme helped you to be confident about undertaking audit?	17 (53.1)	15 (46.9)
Have you ever been involved in further research and/or audit after graduation?	17 (54.8)	14 (45.2)
Did the evidence of your research been utilized in any decision making were you worked or in in healthcare or community settings.	21 (87.5)	3 (12.5)

Source: Devised by author (the Head of the Clinical Nutrition Department)

DISCUSSION AND CONCLUSIONS

The overall objective of the study was to comprehensively assess the status and profile in research for KAU dietetics programmes. The study is the first to approach a diaspora of alumni dietetic professionals that are graduates of the programme to measure their current practice in research and to evaluate their understanding and attitudes in the direction of research activities. It is expected that the results of this survey will help the KAU CLN department in establishing a strategic plan in relation to research. Benchmarking and performance indicators to ensure research quality will also be identified for the CLN programme.

In KAU, the undergraduate degree programme in nutrition and dietetics is taught within the Faculty of Applied Medical Sciences (FAMS). The programme, which was established in 2005, is considered the second largest programme in the Kingdom

of Saudi Arabia (FAMS CLN, 2016)³ with 188 graduates up to the academic year 2014-2015. The programme leads to a BSc, and gives a qualification in nutrition and dietetics (CLN, 2016; Head of Department message). In March 2016, the programme was internationally accredited by the Accreditation Agency in Health and Social Sciences (AHPGS)⁴.

The development of research skills for many health professions begins in undergraduate education; to date there is limited evidence regarding effective research teaching and learning approaches (Davidson and Palermo, 2015). The CLN involvement in research has been developed to be consistent with the nature and mission of the department, faculty and institution (CLN mission/objectives/goals, 2016). The study demonstrated that the CLN programme is using a systematic approach in teaching and training in research skills, which was appreciated by the external examiners, CLN students in research, and a number of publications that been achieved for some projects.

Undertaking research and audit projects is one of the approaches used through the KAU CLN programme as one of the transferable skills. The approach aim is to develop transferable skills and meet the criteria outlined in the standards of proficiency for eligibility for the Saudi Commission for Health Specialties (SCFHS). The assessment strategies followed for the KAU CLN students' research include scientific research writing, mock viva, seminars where students present their work, and oral/posters participation that are faculty, institutional and ministry based. Students could also undertake shared and interdisciplinary research within the subject area. Some research was conducted in collaboration with other health professionals, including physicians, medical technologists, physiotherapists or radiologists. Support for students in their research is by their mentors/supervisors, teaching assistants, head of the programme and the scientific committee. Other support is through access to Student Learning Services and IT support, KAU Digital Library and libraries around the university or the university hospital.

Accreditation is vital to safeguard the sustainability of quality for higher education programmes, particularly in research (Brence and Rivža, 2011). As reported by Arif and Smiley (2004), for the success of an organization or a programme, KPIs need to be frequently measured and tracked on a regular basis. If they do not meet the programme goals at that time, practices or systems need to be adjusted. This will allow research by the KAU CLN to successfully meet the NCAAA and international standards enumerated and proposed in research. The suggested KPIs to be measured in research should include research funding and expenditures, which are currently not measured or benchmarked internally or externally. A programme

³ Faculty of Applied Medical Sciences - Clinical Nutrition Department can be accessed at http://nut.kau.edu.sa/Default.aspx?Site_ID=142006&Ing=EN

⁴ The AHPGS is a European agency that is based in Germany and has specific criteria for providing accreditation (AHPGS, 2012).

research fund using different resources (internal and external) should be established for the next strategic plan. The number of refereed publications should be increased by at least 10% per year. In addition, faculty scholarship through extra-departmental partnerships should be increased by at least 10% per year.

Research involvement is major to the practice of dietetics, and faculty members should be ideally placed to contribute to this. The faculty contribution to research is also one of the important suggested indications by the NCAAA for programme quality and should be evaluated annually and benchmarked internally and externally (NCAAA, 2009). The NCAAA also stresses that all staff teaching in higher education programmes should be involved in sufficient appropriate scholarly activities to ensure they remain up-to-date with developments in their field; they recommend that developments in research should be reflected in their teaching. What is more, the Ministry of Higher Education in KSA emphasize staff contributions to research and consider this contribution in staff evaluation and promotion criteria. The ministry also recommended incentives for worldwide published research in journals with a high impact factor, such as those indexed by Thomson Reuters (ISI Journals), and encouraged the employment of research excellence chairs and centres.

Davidson and Palermo (2015) reported personal interest, guidance from role models, and supervisors' power attitudes in the direction of research. Conversely, the study showed that although faculty members were well engaged in students' research projects, not all of them were concerned about publication activities for their own conducted work or projects of those under their supervision. Publications were limited to some faculty staff only. This could have an impact on students' future practice concerning this activity.

Studies have identified a range of influences that impact faculty research participation, many of which are relevant to registered dietitians; these could also be applicable to CLN faculty members and affect their involvement in research. Similar to international influences, the participation of CLN faculty members in research could be affected by the role of the institution and/or the department in research attitude and research activities. For example, greater teaching responsibilities (12-14 credit hours per week in addition to community and administrators work through different committees) would not allow enough time for research. The length of the application process when applying for grants from the Deanship for Scientific Research or other Non-KAU institutions could correspondingly be a reason.

To successfully implement evidence-based practice, dietetic professionals must understand research procedure to enable an up-to-date critique of relevant evidence (Stephens *et al.*, 2009). Despite evidence-based practice being a core standard for all dietetic professionals, and despite the learning and training in research students went through during their programme of study, few graduates (45%) of the KAU CLN programme are engaged in research at present. However,

32% of participants are currently involved with work that is related to postgraduate studies, and more than 50% of graduates are continuing their education in Western countries that are leaders in the profession of dietetics. This diversity in postgraduate education in the field of dietetics, particularly when collaboration between a diaspora in the profession is considered, will enrich the research in the department (Aljaaly, 2015).

Although the KAU CLN programme administrators and the Committee for Quality and Accreditation are responsible for ensuring the quality of the programme, including research, all teaching staff need to know and practice how they can judge and monitor research quality, use quality systems with Key Performance Indicators (KPIs), and benchmarking to maintain the quality in teaching and training in research.

The response rate for alumni students to the present survey was very low (18%), which confirms the need to establish a new alumni unit or activate one of the present colleges or departmental-based units. Programme administrators should also continue to use different feedback surveys and seek support from all stakeholders to evaluate and maintain their research status and profile. Periodic and continuous reports should also be prepared on teaching, training and publications of research at different levels (institutional-college-centre-department and programme-individual levels), and efforts should be made to integrate to improve the quality of research in the field of nutrition and dietetics. The lack of students' answers to the qualitative component of the satisfaction survey means that it lacks the appropriate depth to sufficiently use this feedback to suggest appropriate changes or developments in present research. Students' answers may also have been influenced by the timing of the survey (at the end of the semester).

Future research should incorporate focus groups to enable an in-depth investigation of research status and account for discourse among current students' and graduates' views. Finally, we searched not just for an understanding of how to assess the conducted evidence-based research, but also to persuade future Saudi dietetic researchers to become involved in good research.

RECOMMENDATIONS AND IMPLICATIONS

1. For the KAU dietetic programme to meet the accreditation process and compete nationally, regionally and internationally with other dietetic programmes with regards to practice in research, continuous monitoring for the quality of research should be carried out using KPIs, feedback surveys with the involvement of graduates and other stakeholders.
2. The KAU CLN programme graduates should be surveyed on a regular basis, and new graduates should be approached six months after graduation. There is the opportunity of following these graduates longitudinally to extend the further development of their research skills

through practical locations and other learning activities, as well as their involvement with research following their degree. This longitudinal evaluation will assist with providing solid outcomes regarding the improvement of research activities and skills.

3. It has been suggested that research skill development for dietitians should commence early in their undergraduate training and involve real experiences. With the growing student numbers in the KAU CLN programme, providing “real” experience is challenging and so unique teaching and learning approaches must be developed. Students should also be trained to identify major components to consider in defining the criteria of quality, establishing funds, research awards, data collection and reports.
4. The programme administrators also need to foster the publication status for the teaching staff and graduation research projects.
5. Conduct poster competition sessions/oral presentations for students to present their work, either inside or outside the KAU, after they complete their work, and invite experts in the field to evaluate the type of research and the process used in conducting it.
6. Conduct annual meetings/conferences for students and other dietetic students from other universities inside the country, to encourage young dietetic researchers to present their work and discuss with others in the field.
7. Benchmarking with other research conducted through other programmes inside or outside the country is vital to evaluate the research status.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this work.

ACKNOWLEDGEMENTS

The author acknowledges, with thanks, the 33 Nutrition and Dietetics graduates of the academic years 2008-2009 to 2014-2015 who responded to the alumni feedback survey. The author would also like to acknowledge the support of the **FAMS academic affairs** and the TA **Mariam Hafez** in providing names and contacts of alumni students. Thanks also for the TA **Sarah Aarfsha** for her excellent efforts in engaging the CLN graduates in this study. Special thanks for the TA **Atheer Attar** for her excellent work in collecting data related to student/staff research projects and research publications for the CLN programme. The author also thanks the CLN secretaries Miss **Shaza Abdulla** and Miss **Dana Alsaman**

for their support in conducting and completing this work. A profound thanks to my colleague Dr **Nagat Eltoum** for her statistical support for this study. Most sincere thanks to Dr Nahlaa Khalifa, the FAMS EQUAP coordinator, for her help in this study. Lastly, I appreciate my son Ahmed Hussein for his continuous help and support concerning IT services and proof-reading of this work.

REFERENCES

- AHPGS (2012): [Online] Available at: http://ahpgs.de/wp-content/uploads/2014/11/accred_criteria.pdf [Accessed January 2016].
- Aljaaly, E. (2015): Part IV: Public health and Medical Sciences, Development of professionalism and dietetic practice: a critical role for the nationally dispersed group of leaders and futurists in the field of nutrition and dietetics. In Ahmed, A.: *Reconnecting Universities with the Discourse of Sustainable Inclusive Growth*. WASD. pp.134-46.
- Arif, M. and Smiley, F.M. (2004): Baldrige theory into practice: a working model. *International Journal of Educational Management*, 18(5), pp.324-28.
- Brence, I. and Rivža, B. (2011): Evaluation of Higher Education Programmes for Increasing Quality and Competitiveness: Case of Latvia. In *Proceedings of the EAIR 33rd Annual Forum (CD format)*, 2011.
- Catherwood, R. (2013): *Alumni news is not really alumni engagement*. [Online] Available at: <http://higheredlive.com/alumni-news-is-not-really-alumni-engagement/> [Accessed 15 March 2016].
- Davidson, Z.E. and Palermo, C. (2015): Developing Research Competence in Undergraduate Students through Hands on Learning. *Journal of Biomedical Education*. Article ID 306380, 9 pages.
- Harrison, J.A., Brady, A.M. and Kulinskaya, E. (2001): The involvement, understanding and attitudes of dietitians towards research and audit. *J Hum Nutr Diet*, 14(4), pp.319-30.
- ICDA (2012): *ICDA Reports. Dietitians around the World, Their education and their work*. [Online] International Confederation of Dietetic Associations Available at: <http://www.internationaldietetics.org/Downloads/2012-ICDA-Education-Work-report.aspx> [Accessed 25 March 2016].
- King Abdulaziz University (2014): *Assessment and Evaluation Administration*. [Online] Available at: http://aea.kau.edu.sa/Default.aspx?Site_ID=914&Lng=EN [Accessed 07 April 2016].
- King Abdulaziz University (2014): *Clinical Nutrition Department*. [Online] Available at: http://nut.kau.edu.sa/Default.aspx?Site_ID=142006&lng=EN [Accessed 25 March 2016].
- King Abdulaziz University (2014): *King Abdulaziz University*. [Online] Available at: http://www.kau.edu.sa/home_ENGLISH.aspx [Accessed 25 March 2016].
- King Abdulaziz University (2015): *Head of Department Message*. [Online] Available at: <http://nut.kau.edu.sa/Pages-Head-Department-Message.aspx> [Accessed 25 March 2016].
- King Abdulaziz University (2015): *Study Plan*. [Online] Available at: <http://nut.kau.edu.sa/Pages-Study.aspx> [Accessed 25 March 2016].
- King Abdulaziz University (2015): *Vision, Mission, Goals and Objectives*. [Online] Available at:

- <http://nut.kau.edu.sa/Pages-mi.aspx> [Accessed January 2016].
- Lenn, M.P. (1992): Global Trends in Quality Assurance in Higher Education. *World Education News & Reviews*, 5(2), pp.20-21.
- Lyddon, J.W. and McComb, B.E. (2008): Strategic reporting tool: Balanced scorecards in higher education. *The Journal of Applied Research in the Community College*, 15(2), pp.163-70.
- MacLellan, D. (2010): *Final Report of the International Confederation of Dietetic Associations (ICDA) Evidence-based Practice Working Group*. International Confederation of Dietetic Associations.
- National Commission for Academic Accreditation & Assessment (2009): *Standards for Quality Assurance and Accreditation of Higher Education Institutions*. [Online] Available at: <http://www.pnu.edu.sa/en/Deanships/Quality/Documents/NCAAA/Standards%20Institutions.pdf> [Accessed 10 March 2016].
- National Commission for Academic Accreditation & Assessment (2015): *NCAAA Key Performance Indicators*. [Online] Available at: <http://www.ncaaa.org.sa/en/Releases/KeyPerformanceIndicatorDocuments/Key%20Performance%20Indicators.pdf> [Accessed 25 March 2016].
- Parmenter, D. (2010): *Key performance indicators (KPI): Developing, implementing, and using winning KPI's*. 2nd ed. Hoboken, New Jersey: John Wiley & Sons Inc.
- Saudi Commission for Health Specialties (2009): *Professional Classification and Registration of Health Practitioners Manual. 1430 AH – 2009 A.D, 5th Edition*. [Online] Available at: <http://mohe.gov.sa/en/Ministry/General-administration-for-Public-relations/BooksList/book8eng.pdf>.
- Slawson, D.L., Fitzgerald, N. and Morgan, K.T. (2013): Position of the Academy of Nutrition and Dietetics: The Role of Nutrition in Health Promotion and Chronic Disease Prevention. *Journal of the Academy of Nutrition and Dietetics*, 113(7), pp.972-79.
- Stephens, D., Taylor, N.F. and Leggat, S.G. (2009): Research experience and research interests of allied health professionals. *J Allied Health*, 38(4), pp.e107-11.
- Whelan, K. and Markless, S. (2012): Factors that Influence Research Involvement among Registered Dietitians Working as University Faculty: A Qualitative Interview Study. *J Acad Nutr Diet*, 112(7), pp.1021-28.
- Whelan, K., Thomas, J.E. and Madden, A.M. (2007): Student Research Projects: The Experiences of Student Dietitians, University Faculty Members, and Collaborators. *J Am Diet Assoc*, 107(9), pp.1567-74.
- Zapato, L. (2008): *Lord Kelvin "Quotations". On Measurement*. [Online] Available at: <http://zapatopi.net/kelvin/quotes/> [Accessed 25 March 2016].
-

BIOGRAPHY

Dr Elham Aljaaly is a Saudi national. She is an assistant professor and the Vice Dean for the female section, the Head of the Clinical Nutrition programme at the Medical Applied College, King Abdulaziz University in Jeddah, Saudi Arabia. Elham is the Chairperson of the Commission for Academic Accreditation for the Clinical Nutrition Programme. She is also a Consultant Editor for the International Journal of Food, Nutrition and Public Health (IJFNPH), and an editorial member for the Arab Journal of Nutrition and Exercise (AJNE). She has reviewed articles submitted to the World Journal of Science Technology and Sustainable Development (WJSTSD); reviewed abstracts to annual meetings and conferences related to King Abdulaziz University and the Higher Education. She also reviewed and took decisions on a number of proposals submitted to King Abdulaziz City for Science and Technology (KACST) for grants. Dr Aljaaly has been nominated by the World Association for Sustainable Development (WASD) as a track chair in different conferences related to WASD, including the track for medical sciences and public health, food nutrition and public health, and public policy and higher education. Elham holds an MSc in Human Nutrition from the University of Sheffield, and a PhD in Environmental Health from CIHD, ICH, UCL, London. She has completed two Post-Doctoral programmes in the UK. She was a member of different committees in the Saudi Council for Health Specialists. She has published articles on the nutritional status of adolescents and food advertising, dietetic practice and professionalism, and on policies and higher education. She has been an invited speaker at many national, regional and international conferences since 1986 to present.