

Linking Immigrants with Nutrition Knowledge (Project LINK): An Innovative Approach to Improve Cultural Competence in Dietetic Education

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ABSTRACT

Linking Immigrants with Nutrition Knowledge (Project LINK) was a service-learning cultural competence training programme completed by undergraduate dietetic students enrolled in the University of Saskatchewan's (USASK) nutrition and dietetic programme.

This paper evaluates the impact of participation in the programme on students' cultural competence. We conducted a cross-sectional survey and qualitative analysis of reflective essays of 107 participants of Project LINK from 2011 to 2014. Cumulative logistic regression models assessed the impact of the intervention on students' cultural competencies. The Akaike information criterion compared models and Spearman correlation coefficient identified possible correlation among pre- and post-intervention data points. Student reflective essays were analyzed by inductive thematic analysis.

All cultural competencies improved comparing pre- and post-participation in Project LINK. Odds of increasing one level of student knowledge were 110 times of that prior to Project LINK. Comparing student competencies before and after Project LINK, the odds of increasing one level of students' *skills* were six times greater, five times greater for increasing one level of students' ability to *interact* or *encounter*, and 2.8 times greater for increasing one level of students' *attitude*.

The results of this study indicate Project LINK has successfully increased cultural competence and underscores the importance of combining opportunities for practical experience in addition to classroom-based training on cultural competence.

Key words: cultural competence, dietetic students, professional practice, diversity, immigrants.

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RÉSUMÉ

Le projet LINK (*Linking Immigrants with Nutrition Knowledge*) est un programme de formation à la compétence culturelle basé sur l'apprentissage par le service qui a été réalisé par des étudiants en diététique du premier cycle inscrits au programme de nutrition et de diététique de l'Université de la Saskatchewan (USASK).

Cet article évalue l'impact de la participation au programme sur la compétence culturelle des étudiants. Nous avons mené une enquête transversale et une analyse qualitative des dissertations de réflexion de 107 participants au projet LINK entre 2011 et 2014. Des modèles de régression logistique cumulative ont évalué l'impact de l'intervention sur les compétences culturelles des étudiants. Le critère d'information d'Akaike a permis de comparer les modèles, tandis que le coefficient de corrélation des rangs de Spearman a mené à l'identification de possibles corrélations entre des points de données avant et après l'intervention. Les dissertations de réflexion des étudiants ont été analysées par analyse thématique inductive.

La comparaison des paramètres avant et après la participation au projet LINK a révélé que toutes les compétences culturelles se sont améliorées. La probabilité que le niveau de connaissances des étudiants augmente était 110 fois plus élevée après le projet LINK. Une comparaison des compétences des étudiants avant et après le projet LINK a montré que la probabilité d'augmenter le niveau de compétences des étudiants était six fois plus élevée. Elle était cinq fois plus élevée pour l'augmentation du niveau de capacité d'interaction ou de « rencontre » des étudiants, et 2,8 fois plus élevée pour l'augmentation du niveau d'attitude des étudiants.

Les résultats de cette étude indiquent que le projet LINK a permis d'améliorer les compétences culturelles et soulignent l'importance de combiner des occasions d'acquies de l'expérience pratique à une formation en classe sur les compétences culturelles.

Mots-clés : compétence culturelle, étudiants en diététique, pratique professionnelle, diversité, immigrants.

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INTRODUCTION

In 2021, immigrants represented 23% of, or 2.3 million, people in Canada, the largest proportion since the Confederation in 1921. It is estimated that by 2041 immigrants could represent up to 34% of the Canadian population [1]. The growing immigrant population face new and unique challenges [2, 3], and multicultural knowledge and skills are required to provide equitable, culturally competent care [4, 5]. A culturally competent healthcare practitioner understands the importance of

social and cultural influences on patients' health, beliefs, and behaviours, and they consider how these factors interact to provide the most impactful care [1, 2, 6, 7].

Cultural competency training is now recognized and required to be formally integrated into dietetic curricula by accrediting dietetic bodies in Canada and the United States [8, 9]. However, a 2015 survey of 3rd and 4th year Canadian nutrition and dietetic students indicated gaps in cultural competence training and education which left them unprepared as new

practitioners [10]. It is imperative that registered dietitians (RDs) be equipped with the tools to develop cultural competency before they reach practice so that they can equitably and efficiently serve clients from diverse cultures, thus helping to address health disparities among immigrant populations [6, 7].

Purpose

This study presents an innovative programme, *Linking Immigrants with Nutrition Knowledge* (Project LINK), a service-learning cultural competence training programme with the goal of developing and measuring the development of cultural competence in dietetic students. This paper reports the mixed methods evaluation of the association between participation in Project LINK and improvement in cultural competence.

METHODS

Participants and recruitment

Second-year nutrition and dietetic students enrolled in the University of Saskatchewan's (USASK) nutrition and dietetic programme participated in Project LINK in 2011, 2012, 2013, and 2014. Project LINK was a required component of the course NUTR 310.3: "Food, Culture and Human Nutrition." Although all students participated in all course requirements, they were not required to participate in the research study. All students were invited to participate in the study; however, only those who provided informed consent and agreed to complete the pre- and post-programme assessments were included.

Immigrant and refugee families were recruited in July and August each year. Recruitment of these families was co-ordinated with the assistance of Saskatoon Open Door Society and the Saskatchewan Intercultural Association (settlement agencies) in Saskatoon, Saskatchewan. Families selected were recent immigrants or refugees to Canada (< 5 years), had sufficient English proficiency, contained a range of ages (including children), and represented a variety of cultures. Over the 4 years of the programme, 14 immigrant/refugee families were recruited and consented to participate.

Ethical approval for this evaluation was obtained from the University of Saskatchewan Research Ethics Board before implementation (USask REB BIO-09-197). Additionally, students were required to undergo a criminal record check to work with vulnerable populations.

Project LINK active-learning module

Project LINK was implemented in the fall semester of each of the 4 years. Enrolled students were briefed on the purpose and components of Project LINK.

Students participated in lessons on cultural competency and intercultural communication as well as a workshop, hosted by the project team, where dietetic students interacted with international graduate students in a role-playing scenario to implement their learnings in a semi-hypothetical situation before beginning any components of Project LINK and entering into 'real-life' scenarios. In groups of two, students were

partnered with an immigrant/refugee family. The project was designed to ensure students and families could meet frequently during the semester to develop rapport and connection. Four semi-structured opportunities for interaction between student pairs and families were provided: (1) an orientation meeting, (2) rapport developing meeting, (3) a grocery store tour, and (4) a cultural cooking session. Dietetic students were initially introduced to partner families through an informal evening event. Students were instructed to plan rapport developing meetings with their partner family to allow students to gain a better understanding of assigned families' culture and food preferences/choices. For the purpose of observation and guidance, students accompanied assigned families during a grocery shopping trip. Students were encouraged to be open-minded and aware of their own biases (e.g., avoid making or verbalizing judgments about food choices); however, students were encouraged to assist them in selecting healthy, budget conscious foods. Finally, at the project end, students and partner families prepared a dish celebrating the family's culture together.

For most dietetic students, this was their first experience with service-learning and the first opportunity for meaningful interaction with culturally diverse immigrant and refugee families. Learning objectives for the dietetic students were to: (1) gain skills in intercultural communication, (2) understand the challenges, particularly those related to food and nutrition, faced by newcomers to Canada, and (3) participate in the practical application of theories learned in class related to the roles of culture, religion, nutrition transition, and acculturation in shaping the diet of immigrants and refugees.

DATA COLLECTION

Quantitative

Change in cultural competence was assessed using a pre- and post-survey on cultural competency [10]. Students completed this survey at the start of the semester before meeting their partner families, and for a second time after finishing all components of Project LINK. The survey was adapted with permission from the Clinical Cultural Competency Questionnaire developed by Robert Like, which has been used in previous projects [11, 12]. The survey was composed of multiple-choice questions, which used a five-point Likert scale design (responses of very, quite a bit, somewhat, a little, or not at all) and assessed five competence areas: *knowledge, skills, encounters, attitudes, and cultural awareness*. The response data from both the pre- and post-surveys were extracted, anonymized, and coded into a Microsoft Excel spreadsheet (Microsoft Office, Microsoft Corporation, Redmond, WA, USA, 2013).

Qualitative

Additionally, to enrich our understanding of the processes and experiences that aided or detracted from the goals of the project, at semesters end, guiding questions were provided and each student wrote a reflection in response.

DATA ANALYSIS

Quantitative

Descriptive statistics were computed to determine the percent change in student cultural competency areas before and after participating in Project LINK. Further, a cumulative logistic regression model was developed to analyze the association between project participation and cultural competency. Model assumptions were tested and satisfied, and fulfillment of the proportional odds assumption confirmed employing the score test (p -value >5%). Spearman correlation coefficient between pre- and post-cultural competencies showed ignorable within-individual correlations (≤ 0.214) and, therefore, biased estimation or inference was unlikely. This was confirmed by comparing results of the generalized estimating equations method and logistic regression. Pearson and Deviance goodness-of-fit statistics were used to evaluate the adequacy of the final model. All the statistical analyses and data cleaning were performed in SAS 9.3 (SAS Institute Inc., Cary, NC, USA. 2011).

Qualitative

Student reflective essays were analyzed by inductive thematic analysis (SF). Names were removed from reflection papers before analysis. New and recurrent ideas were recorded, and each reflection paper was examined several times to reduce missed ideas. These ideas were then summarized into categories and analyzed to produce cohesive themes. Exemplar quotes were chosen to illustrate each sub-theme; care was taken to ensure these quotations remain applicable out of the context of original sources. Two neutral researchers (HV, CH) confirmed the analysis and the absence of bias.

RESULTS

Participant characteristics

Paired pre- and post-surveys were obtained from 107 students. The students who participated in Project LINK were second-year dietetic students, predominantly White and female. Before Project LINK, only two students identified themselves as having professional experience interacting with people of different cultures. The families who participated in

Project LINK were recent immigrants to Saskatoon, Saskatchewan (less than 2 years). The countries which participants migrated from varied over the years of Project LINK and reflected the global situation at the time and the resulting migration patterns, and included Karen, Afghan, and Iraqi refugees.

Students' cultural competence

Table 1 presents the odds of increasing one level in cultural competence areas from pre- to post-intervention. Odds of increasing one level *knowledge* after Project LINK were approximately 110 (95% CI: 32.4–378.4) times of that prior (Table 1). Such substantial significant increases were not seen in the other four areas: however, participants improved cultural competence *skills*, *encounters*, and *attitudes*. Results did not change year by year, confirmed by no interaction between pre- and post-indicator year.

Figure 1 shows the percentage of students who rated themselves within the highest two competence levels in both the pre- and post-intervention for each competency area (see Supplemental Figure 1¹ for percentage of students who rated themselves within the lowest two competence levels). A larger percentage of students rated overall cultural competence as higher after completion. Only the competence areas of *knowledge* and *skills* showed statistically significant increases, but the data show a trend of increasing competence in the areas of *encounters*, *attitudes*, and *cultural awareness* (Figure 1).

Table 2 and Supplemental Table 1¹ represent findings illustrating the thematic analysis of reflection papers. Four major themes (application of classroom learning, student perceptions, benefits to immigrant and refugee families, challenges faced by students) along with sub-themes were identified. These four themes and their sub-themes exemplify the impact of Project LINK both in the context of student learning and the benefits provided to recent immigrants and refugees. Processes to improve the operation of Project LINK were also captured. Overall, the themes identified from reflections demonstrate how students benefited in many aspects of cultural competence.

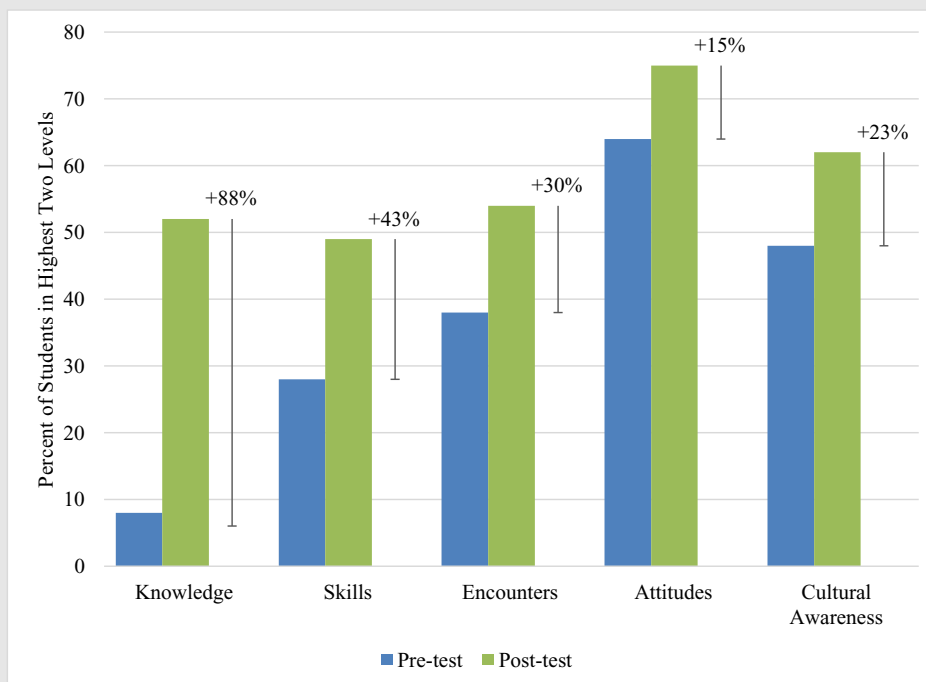
Table 1. Change in components of cultural competency after intervention ($n = 107$)¹.

Cultural competency	Odds ratio	95% CI		Pr > Chi-square
		Lower limit	Upper limit	
Knowledge	110.8	32.4	378.5	<.001
Skills	6.4	3.5	11.7	<.001
Encounters	4.9	2.7	9.0	<.001
Attitudes	2.8	1.2	6.8	0.02

¹Odds ratios, their 95% confidence intervals, and corresponding p -values of pre- and post-intervention.

¹Supplementary data are available with the article at <https://dcjournal.ca/doi/suppl/10.3148/cjdpr-2023-025>.

Figure 1. Competence levels and percent change of students in highest two levels of pre- and post-tests ($n = 107$).



DISCUSSION

Project LINK provided the academic platform to support dietetic students in learning how culture impacts dietetic practice, such as through the provision of culturally appropriate care and the significant influence of culture in our food choices. The dietetic students who participated in Project LINK gained skills and built meaningful relationships with participating families.

Comparable service-learning projects among nursing students reported by Hsui-Chin et al. (2012) and Kohlbry (2016) reported significantly increased cultural competence scores [13, 14]. Although only two competence areas (*knowledge* and *skills*) showed statistically significant increases, our findings indicate a trend towards increasing scores in the other competence areas (*attitudes*, *cultural awareness*, and *encounters*). Dietetic students rated their comfort as high in the post-survey; but this was only slightly higher than the pre-survey (38% vs 54%). However, dietetic internship preceptors reported observing a substantial difference in the student's comfort and confidence in supporting clients with diverse cultural backgrounds after their participation in Project LINK. Given the cultural homogeneity, dietetic students from Saskatchewan may have limited experience with people from different cultures or ethnicities. One student's comment exemplified this quite well: '*since I grew up on a farm, I feel as though I was somewhat isolated and never directly exposed to different cultural groups that are more commonly situated in urban areas*' (Supplemental Table 1)¹.

The *attitudes* competence domain shows most students entered Project LINK with positive attitudes towards people of different cultures at 64% in the pre-survey, which increased to 75%. As students' rated level of comfort in *encounters* with people of different cultures as relatively low, it is surprising to find that students had comparatively positive attitudes. This could be due to challenges students have in translating attitude into practice or encounters with patients. This highlights the need for additional engagement/encounters to put into practice what is learnt in a classroom setting and that simply providing education on cultural competencies alone is not a sufficient approach. Project LINK provided students with the opportunity to gain experience interacting with people of different cultures, which may have translated into greater comfort and confidence in interacting with people of different cultures when they entered professional practice.

Results indicate Project LINK improved dietetic students' cultural competence; however, we cannot conclude that students achieved true cultural competence via participation in the project. As proposed by Campinha-Bacote (2002) in their model for cultural competence in healthcare providers, true cultural competence is gained as the areas of overlap between all five constructs of cultural competence increase, because with increasing overlap, the healthcare provider deeply internalizes the constructs of competence [15]. Consequently, dietetic students who participated have started their journey towards cultural competence but require continual learning in order to become culturally competent.

Table 2. Major themes identified through student reflections.

THEME 1: APPLICATION OF CLASSROOM LEARNING	
Student ideas or experiences, which support enhanced learning and development of skills required to be a successful practicing dietitian	
Sub-themes	Quotes
Experience with different cultures	<i>"It is one thing to be told and read about cultural differences in a classroom and another to actually experience cultural differences."</i>
Intercultural communication	<i>"I learned that smiles are universal..."</i>
Globalization	<i>"... the family has located an Iranian food store in the city, [but] it does not provide all of the products they require, and they still order many traditional Iranian food products from back home."</i>
Barriers to food security	<i>"I learned that many immigrants and refugees have problems accessing affordable and culturally appropriate foods. Transportation to a grocery store and language barriers are common causes."</i>
Dietary acculturation	<i>"... the process of acculturation is affecting the food choices my assigned family makes because they are choosing more deep-fried foods and also eating out at restaurants such as McDonald's more often."</i>
THEME 2: STUDENT PERCEPTIONS	
Students' perceptions on the impact of culture in providing care to immigrants and refugees using Project LINK as a learning tool.	
Sub-themes	Quotes
Changes in perspectives	<i>"I was also able to acknowledge and overcome some of the prejudices I may have had with regards to refugees and immigrants."</i>
Valuing families cultures	<i>"They were extremely welcoming, and it was clear that they were very excited to cook a meal for us and teach us more about their culture."</i>
Recognition of the practical experience	<i>"... the interactive, practical experience has been invaluable. Rarely in our courses do we have the opportunity to get hands-on field experiences as dietitians on training; thus, this project is unique and highly relevant to our future careers."</i>
THEME 3: BENEFITS TO IMMIGRANT AND REFUGEE FAMILIES	
Students' insights on the beneficial social and community impact of Project LINK to immigrant and refugee families	
Sub-themes	Quotes
Opportunity to practice English	<i>"I feel that our immigrant family benefitted by participating in this project by getting a chance to practice their English. We communicated in person, over the phone and via email."</i>
Connection and interaction with Canadians	<i>"I think the family benefitted from this project simply by meeting Canadian citizens. It was nice for them to be able to ask questions about our culture."</i>
Nutrition knowledge	<i>"Our family benefitted mostly from the grocery store tour, where they learned to understand and interpret nutrition labels. They also began selecting healthier alternatives [...] than they normally do, like juice with folate instead of fruit beverages!"</i>
THEME 4: CHALLENGES FACED BY STUDENTS	
Students' perceived challenges in completion of Project LINK	
Sub-themes	Quotes
Communication barriers	<i>"The language barrier was the most difficult challenge we had to deal with ... the families didn't have a clear understanding of the project and what it entailed."</i>
Perceived role in giving nutritional advice	<i>"I feel there is a disconnect with the expectations this course places on students and our current level of nutritional awareness and counseling competency."</i>
Level of detail	<i>"The assignments asked for such specific information that I felt that I was continuously directing the conversations with my family so that I would be able to answer the questions for the assignments."</i>
Note: See Supplemental Table 1 ¹ for description of themes and additional quotes.	

Project LINK included various activities such as preparing cultural foods, interviewing persons in other cultures, recording experiences in writing, and opportunities to observe home food preparation, handling, and storage in other cultures. A 2020 review of cultural competency training and evaluation methods in dietetics indicated that service learning is an effective method to expand knowledge in diverse communities [16]. The activities in which students engaged during Project LINK are unique compared to other local service-learning programmes and models, thus demonstrating the unique opportunity provided by Project LINK as a learning tool [7, 16]. The work by the Project LINK team has continued on a smaller scale, exposing students to cultural competency skills and different health beliefs and practices through the NUTR 310.3 course and other avenues at the University of Saskatchewan.

LIMITATIONS

Cultural competence is subjectively measured and can only be assessed accurately by the individual; thus, generalization of results should be done with caution. Further, the sample of students was small and chosen by convenience, which may reduce generalizability. Additionally, this study design lacks uniformity of the students' experiences with different families and at different times, which may have impacted the results.

RELEVANCE TO PRACTICE

Our results are valuable to educators and programme leaders intending to add cultural competence training activities to dietetic education programmes. Provision of adequate education together with 'real-life' practical training is imperative for increasing cultural competence and decreasing barriers to care in dietetics [2, 5, 7, 10, 16, 17]. Project LINK provided hands-on experiences to dietetic students to gain skills, knowledge, and confidence when working with patients from different cultures. Multicultural service-based learning and training within dietetic educational programmes is a medium that can provide RDs with the skills, practice, and mindset required to provide high quality, equitable care to all.

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