

Identifying and Mapping Canadian Dietetic Students' Interaction(s) with Simulation-Based Education: A Scoping Review

YINGYING ZHANG, BSc^a; MEGAN CHURCHILL, BSc^{a,b}; JESSICA MANNETTE, MA^a; MELISSA ROTHFUS, PhD, MLIS^c; AMY MIREAULT, Pdt^a; ANTONIA HARVEY, Pdt, MScAHN^{a,d}; KELLY LACKIE, RN, PhD, CCSNE^e; KATHRYN HAYWARD, MN^e; JUDY FRASER ARSENAULT, Pdt, MAHE^a; DAPHNE LORDLY, Pdt, Ded., MAHE^a; SHANNAN GRANT, Pdt, MSc, PhD^{a,b,f}

^aDepartment of Applied Human Nutrition, Mount Saint Vincent University, Halifax, NS; ^bDepartment of Obstetrics and Gynecology and Pediatrics, IWK Health Centre, Halifax, NS; ^cWK Kellogg Health Sciences Library, Dalhousie University; Aligning Health Needs and Evidence for Transformative Change (AH-NET-C): A JBI Centre of Excellence, Halifax, NS; ^dDepartment of General Medicine, Cardiology, Dartmouth General Hospital, Nova Scotia Health Authority, Dartmouth, NS; ^eSchool of Nursing, Dalhousie University, Halifax, NS; ^fDepartment of Obstetrics and Gynaecology and Pediatrics, Dalhousie University, Halifax, NS

ABSTRACT

This scoping review mapped literature available on Canadian dietetics, nutrition, and foods students' and graduates' interaction(s) with simulation-based education (SBE) during undergraduate and/or practicum. One certified Librarian led the preliminary search (Summer, 2021), while three Joanna Briggs Institute-trained reviewers conducted the comprehensive search via MEDLINE (OVID), CINAHL (EBSCO), Academic Search Premier (EBSCO), Embase (Elsevier), Scopus (Elsevier), and Google (February 2022). A data extraction tool designed specifically for the study objectives and research inclusion criteria was used. We recorded 354 results and included 7. Seven types of SBE were recorded: (i) comprehensive care plan (n = 2); (ii) nutritional diagnosis/assessment (n = 2); (iii) body composition assessment (n = 1); (iv) introducing patient to dysphagia care (n = 1); (v) nutrition counselling session (n = 1); (vi) nutrition-focused physical examination (n = 1); and (vii) professional communications via social media (n = 1). Results indicate that Canadian dietitian-led SBE includes the use of simulated patients, nutritional diagnosis/assessment, and the creation of comprehensive care plans, among others. Students have been assessed for performance of trained tasks through exams, self-awareness surveys, and interviews, and SBE activities have been evaluated for effectiveness through questionnaires and interviews with users/students. Canadian literature is limited, and more can be learned by exploring the global context within and outside the profession.

Key words: assessment, Canada, dietetics, experience, simulation, students.

(Can J Diet Pract Res. 2023;84:233–241)

(DOI: [10.3148/cjdpr-2023-016](https://doi.org/10.3148/cjdpr-2023-016))

Published at [dcjournals.ca](https://www.dcjournals.ca) on 12 July 2023

RÉSUMÉ

Cette étude de la portée a permis de faire le relevé de la littérature disponible sur les interactions des étudiants et diplômés canadiens en diététique, nutrition et alimentation avec l'enseignement par la simulation (ES) pendant leurs études de premier cycle et/ou stages. Un bibliothécaire certifié ont réalisé la recherche préliminaire (été 2021), tandis que trois évaluateurs formés par le Joanna Briggs Institute ont effectué la recherche exhaustive via MEDLINE (Ovid), CINAHL (EBSCO), Academic Search Premier (EBSCO), Embase (Elsevier), Scopus (Elsevier) et Google (février 2022). Un outil d'extraction des données conçu précisément pour les objectifs de l'étude et les critères d'inclusion de la recherche a été utilisé. Nous avons consigné 354 résultats et en avons inclus 7. Sept types d'ES ont été consignés : (i) plan de soins complet (n = 2); (ii) diagnostic nutritionnel/évaluation nutritionnelle (n = 2); (iii) évaluation de la composition corporelle (n = 1); (iv) introduction du patient aux soins de la dysphagie (n = 1); (v) séance de counseling en nutrition (n = 1); (vi) examen physique axé sur la nutrition (n = 1); et (vii) communications professionnelles via les médias sociaux (n = 1). Les résultats indiquent que l'ES mené par des diététistes canadiens comprend, entre autres, l'utilisation de patients simulés, le diagnostic nutritionnel/l'évaluation nutritionnelle et la création de plans de soins complets. La capacité des étudiants à réaliser les tâches enseignées a été évaluée au moyen d'examens, de sondages sur la conscience de soi et d'entretiens, et l'efficacité des activités d'ES a été évaluée au moyen de questionnaires et d'entretiens avec les utilisateurs/étudiants. La littérature canadienne est limitée et on peut en apprendre davantage en explorant le contexte mondial à l'intérieur et à l'extérieur de la profession.

Mots-clés : évaluation, Canada, diététique, expérience, simulation, étudiants.

(Rev can prat rech diétét. 2023;84:233–241)

(DOI: [10.3148/cjdpr-2023-016](https://doi.org/10.3148/cjdpr-2023-016))

Publié au [dcjournals.ca](https://www.dcjournals.ca) le 12 juillet 2023

INTRODUCTION

Simulation-based education in dietetics: Is it “a thing” [1]?

Simulation-based education (SBE) provides realistic scenarios that allow students to develop hands-on skills in their field, including areas such as critical assessment, problem solving,

communication, conflict resolution, evaluation, and management [2–4]. As a sub-category of experiential learning, it has been shown to decrease risk to participants. In fact, SBE has been shown to increase psychological safety for all involved, while increasing student understanding of course material in

classroom and practical settings and decreasing physical risk to patients [5–9]. Moreover, SBE has been identified as an evidence-based approach to interprofessional education (IPE) [10, 11]. Commonly used by healthcare professionals (HCPs) including dietitians, nurses, physicians, dentists, physiotherapists, and occupational therapists during undergraduate, graduate, and practicum training, a wealth of literature and resources are available to those interested in SBE, including best practice guidelines and resources [12–15]. Notwithstanding, the contributions of dietitians do not appear to be mapped, described, or synthesized in the peer-reviewed literature [12–15]. This is despite SBE being an integral part of dietetics, nutrition, and foods (DNF) education since the 1980s.

Current SBE guidelines encourage educators to begin with conceptualizing how a simulation-based activity will meet the course teaching and learning objectives [3, 5, 16]. Learning objectives should shape the simulation or redirect educators to other approaches [3, 17]. Dietetic educators commonly use case studies (as complexity increases, time commitment increases) and role play (reasonable for shorter classes, single sessions) in courses and laboratories, but this work is not accurately represented in the peer-reviewed literature, which is abundant with examples from other HCPs [16, 18].

The SBE literature is diverse in terms of primary outcomes, aims, methods, definitions, and discipline, making the literature difficult to interpret, despite being generally supportive of SBE [16, 19]. Dietitian-led research on SBE appears to concentrate on assessment of student learning outcomes (e.g., knowledge uptake, students' perceived learning) and experience (e.g., satisfaction, lived experience), arguably offering a catalyst or invitation for mapping and knowledge synthesis [20–22]. For instance, dietetic educators in the United Kingdom found that interaction with simulated or standardized patients improved students' communication skills (e.g., attitudes towards learning, understanding importance of, and confidence in communication skills) [21]. To evaluate this, dietetic educators administered a pre/post standardized patient session questionnaire to DNF students [21]. Similarly, when American educators surveyed dietetic students on skill performance and asked them to rate their change in confidence, they found that SBE improved student confidence in their application of the Nutrition Care Process and associated communication skills [23].

Australian and New Zealand dietetic educators have also contributed to SBE literature. For instance, two Australian studies, exploring interprofessional collaboration, found that with the use of SBE, DNF students could better express needs assessments within the context of patient consult and displayed improved teamwork and communication [18, 24]. These studies, led by dietetic clinical educators, included focus groups and a questionnaire to collect data on DNF student learnings [18], as well as directed content analysis of transcripts generated from interviews with students before and after SBE sessions [24]. A New Zealand-based study captured students' experiences and perceptions of SBE as a means of

teaching dysphagia assessment and related diagnosis, intervention, and monitoring through the administration of workshop evaluation forms and surveys. Students reported improved confidence and readiness in this study led by three speech-language pathologists and two dietetic clinical educators [25].

Cultivating solutions by “growing forward”: What are we doing/not doing [26]?

A preliminary literature search, conducted in Summer 2021, led by two certified librarians, and a research intern trained in JBI (formerly known as the Joanna Briggs Institute) methodologies for scoping reviews [27], highlighted that several search terms, including “experiential learning” and “simulation”, differ in definition between countries. For instance, some countries and professions use the terms interchangeably, while others do not [16, 21, 28]. As a place to start, the work of Thompson and Gutschall [16] was used to develop the preliminary search, study introduction/rationale, and the final search strategy.

While there is evidence that dietetic educators engage in and recognize the benefits of SBE, there appears to be limited Canadian literature available on the topic [12, 13, 29]. There is a need to better understand the dietetic professions engagement with this approach to teaching and learning. It is generally recognized that teaching and learning can be enhanced by understanding and considering students [18, 24, 25]. Before synthesis can be conducted, a scoping review is recommended [30, 31]. Synthesis is the contextualization of research studies within the current literature and larger body of knowledge on the topic (e.g., systemic review and meta-analysis) [30]. Knowledge synthesis and scoping reviews are useful for examining emerging evidence, when it is still unclear what other, more specific questions can be posed and valuably addressed, and when there is a need to determine the scope of coverage of a body of literature [30, 31]. A common purpose for conducting such reviews (our purpose) is to identify and map available evidence [30, 31]. Therefore, this scoping review identifies and maps the literature available on Canadian dietetic students' interaction(s) with SBE [27]. The research question is: *What evidence is currently available on Canadian dietetic students' interaction(s) with simulation-based education?* For the purposes of this review, interaction with SBE is defined as participation in and/or exposure to any step(s) of the simulation life cycle [32], as per Dalhousie University, Simulation-based Education and Interprofessional Education Program. The SBE life cycle includes: (i) conceptualizing simulation; (ii) creating an immersive environment; (iii) integrating technology; (iv) simulation assessment; (v) debrief; and (vi) evaluating learning outcomes [32].

METHODS

This scoping review was conducted in accordance with the JBI methodology for scoping reviews, including Peters et al.'s updated guidance on scoping reviews [27, 33], adapted from

Arksey and O'Malley framework [34]. No current or in-progress scoping reviews or systematic reviews exist on this topic.

Inclusion criteria: population, concept, context

This scoping review included literature that demonstrates DNF students' interaction with SBE life cycle in dietetic internship and practicum settings [32]. No restrictions were set for year of students' studies. Graduates were included if the literature reflected interaction with SBE during their time as a student. Dietitians and faculty/staff were considered as graduates; therefore, results investigating dietitians were also included. This review considered results that discussed SBE that provided students with realistic scenarios in classroom and practicum settings. Results were included regardless of the types of simulation used. For instance, studies specific to one or more of full-scale simulation, standardized patients, computer-based simulation, peer-to-peer, and unfolding case studies were included. Both uni-professional and interprofessional simulation were included. This review considered results that took place in Canadian university or dietetic practicum settings.

Types of sources

Both peer-reviewed and gray literature were considered for this review, including, but not limited to, quantitative and qualitative primary research studies, systematic reviews, meta-analyses, text and opinion papers, university websites, healthcare clinic websites, and publicly available reports/disseminations.

Search strategy

To develop the search strategy, an initial limited search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and JBI Evidence Synthesis was conducted to locate relevant results (YZ, SG, JM). In collaboration with a JBI-certified research librarian (MR), the text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy with a set of keywords for CINAHL (MR; see Table 1) [35]. The search strategy, including all identified keywords and index terms, was adapted for each database and/or information source. Results published or translated in English were included. No date of publication restriction was set, as not to exclude resources that may be long-standing.

The databases that were searched included: MEDLINE (OVID), CINAHL (EBSCO), Academic Search Premier (EBSCO), Embase (Elsevier), and Scopus (Elsevier). Google was used to conduct gray literature searches (JM; see Table 2).

Data and evidence selection

Following the database searches conducted on 25th February 2022 (MR), all identified peer-reviewed results were collated and uploaded into Covidence Systematic Review Software (Veritas Health Innovation, Melbourne, Australia. Available at www.covidence.org) and duplicates were removed. Gray literature results were uploaded into Zotero (Corporation for Digital Scholarship, available at www.zotero.org) on 25th February 2022 and duplicates were removed (JM). Following a calibration exercise with the review of 10 articles, titles and abstracts were screened by two independent reviewers (JM, MC) for assessment against the inclusion criteria and potentially relevant peer-reviewed papers were retrieved in full. Peer-reviewed results that did not meet the inclusion criteria at full-text review stage were excluded (see Supplemental Table 1¹ for exclusions). Any disagreements that arose between the reviewers (which were minimal) were resolved through discussion and consensus achieved (JM, MC).

Data and evidence extraction

Data and evidence were extracted from the peer-reviewed papers by two independent reviewers (JM, MC) using a data extraction tool in Covidence (see Supplemental Table 2¹). Evidence from gray literature was extracted using the extraction tool in MS Word (Microsoft Corporation, Redmond WA USA, 2021). The data extracted included specific details about the population, concept, context, and key findings relevant to the review question.

RESULTS

Literature

Results of the search strategy and paper selection process are presented in a PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) diagrammatic flow chart (Figure 1) [36]. Database searches yielded 280 results, identified from five databases. Gray literature searches yielded another 74 results (see Table 2). A total of 354 results were recorded. After duplicates were removed (including four results for which the weblink was broken), 273 results remained for title and abstract screening. Of those, 234 were irrelevant to the research question. The remaining 53 results (19 peer-reviewed and 34 gray literature) were screened against the inclusion criteria, yielding seven results (six peer reviewed and one gray literature) for full-text review (Table 3). The three reasons for exclusion at the full-text review stage were recorded as: (i) not Canadian (n = 10); (ii) simulation was not used/named (n = 21 total; 10 of these were Universities who named SBE on their website as part of DNF curriculum, but did not list or describe types of simulation); and (iii) not DNF students or graduates (n = 15).

¹Supplementary data are available with the article at <https://dcjournal.ca/doi/suppl/10.3148/cjdpr-2023-016>.

Table 1. Search strategy: All searches conducted on 25th February 2022 [35]. CINAHL (EBSCO).

No.	Query	Results
1	((MH "Experiential Learning") OR (MH "Simulations+") OR (MH "Role Playing"))	50,324
2	TI (Simulat* OR "experiential learning" OR mannequin OR manikin OR "role play*" OR "peer to peer" OR "peer-to-peer" OR "peer assisted learning" OR "peer teaching" OR "peer coaching" OR "standardized patient") OR AB (Simulat* OR "experiential learning" OR mannequin OR manikin OR "role play*" OR "peer to peer" OR "peer-to-peer" OR "peer assisted learning" OR "peer teaching" OR "peer coaching" OR "standardized patient")	68,422
3	(MH "Nutrition") OR (MH "Education, Dietetics") OR (MH "Research, Dietetics") OR (MH "Dietetics")	33,494
4	TI ((Diet* OR Nutri*)) OR AB ((Diet* OR Nutri*))	239,405
5	(MH "Students") OR (MH "College Graduates") OR (MH "Students, Dietetics") OR (MH "Students, College") OR (MH "Students, Undergraduate") OR (MH "Interns and Residents") OR (MH "Faculty") OR (MH "Dietitians") OR (MH "Health Educators") OR (MH "Teachers")	88,104
6	TI (Student* OR graduate* OR undergraduate* OR intern* OR trainee* OR learner* OR resident* OR dietitian* OR educator* OR facult* OR professor* OR teacher* OR instructor* OR lecturer*) OR AB (Student* OR graduate* OR undergraduate* OR intern* OR trainee* OR learner* OR resident* OR dietitian* OR educator* OR facult* OR professor* OR teacher* OR instructor* OR lecturer*)	625,875
7	(MH "Canada+")	108,499
8	(canad* or "british columbia" or "Colombie britannique" or alberta* or saskatchewan or manitoba* or ontario or quebec or ("new brunswick" not "new jersey") or "nouveau brunswick" or "nova scotia" or "nouvelle ecosse" or "prince edward island" or newfoundland or labrador or nunavut or nwt or "northwest territories" or yukon or nunavik or inuvialuit or Abbotsford or Airdrie or Ajax or Aurora or Barrie or Belleville or Blainville or Brampton or Brantford or Brossard or Burlington or Burnaby or Caledon or Calgary or Cambridge or "Cape Breton" or Chatham or Kent or Chilliwack or Clarington or Coquitlam or Drummondville or Edmonton or "Fort McMurray" or Fredericton or Gatineau or Granby or "Grande Prairie" or Sudbury or Guelph or "Halton Hills" or Iqaluit or Inuvik or Kamloops or "Kawartha Lakes" or Kelowna or Kingston or Kitchener or Langley or Laval or Lethbridge or Levis or Longueuil or "Maple Ridge" or Markham or "Medicine Hat" or Milton or Mirabel or Mississauga or Moncton or Montreal or Nanaimo or "New Westminster" or Newmarket or "Niagara Falls" or "Norfolk County" or "North Bay" or "North Vancouver" or North Vancouver or Oakville or Oshawa or Ottawa or Peterborough or Pickering or "Port Coquitlam" or "Prince George" or "Quebec City" or "Red Deer" or Regina or Repentigny or (Richmond not Virginia) or "Richmond Hill" or Saanich or Saguenay or "Saint John" or "Saint-Hyacinthe" or "Saint-Jean-sur-Richelieu" or "Saint-Jerome" or Sarnia or Saskatoon or "Sault Ste Marie" or Sherbrooke or "St Albert" or "St Catharines" or "St John's" or "Strathcona County" or Surrey or Terrebonne or "Thunder Bay" or Toronto or "Trois-Rivieres" or Vancouver or Vaughan or ((Halifax or Hamilton or London or Victoria or Waterloo or Welland or Whitby or Windsor) not (UK or "United Kingdom" or Britain or England or Australia)) or Whitehorse or Winnipeg or "Wood Buffalo" or Yellowknife)	241,455
9	1 OR 2	94,209
10	3 OR 4	254,700
11	5 OR 6	655,846
12	7 OR 8	241,457
13	9 AND 10 AND 11 AND 12	30

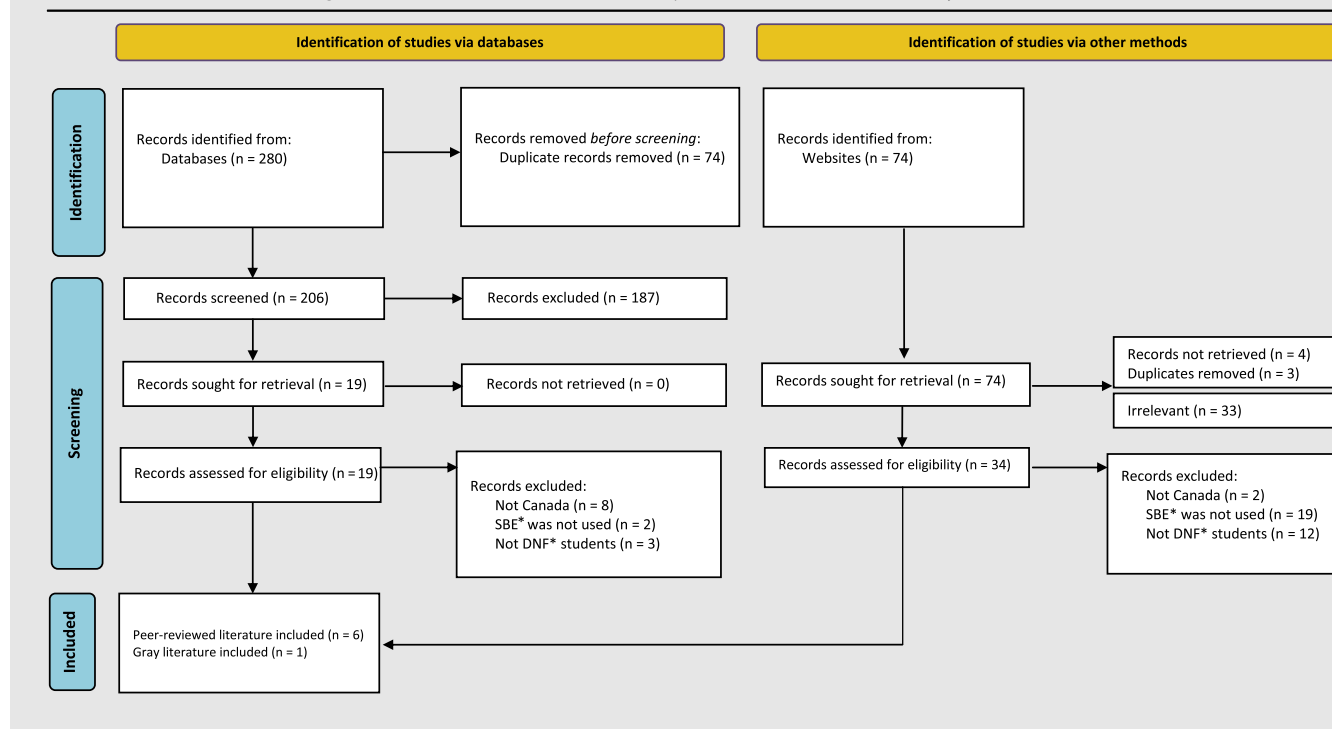
Characteristics of Included Results

The included results in this review were published between 2007 and 2022. Three perspectives in practice (two published 2016, and one 2020), two original research articles (published in 2007 and 2019), and one report (published in 2020) were included from the peer-reviewed literature. The gray literature search yielded one practice blog (published in 2022; 688 words in

length). Below we have organized the findings based on the objectives of this scoping review.

Population

Six of the seven results included were focused on DNF undergraduate and master's students ($n = 311$ cumulative). One peer-reviewed result included Canadian dietitians ($n = 382$).

Figure 1. Search results and study selection and inclusion process [36].

*Acronyms: Simulation-based education (SBE); dietetics, nutrition and foods (DNF).

One of the original research articles included interprofessional teams (n = 25 nutrition students; n = 128 students total).

Concept

A range of types of SBE were covered in the included literature including standardized patient, role-play, case studies, and debriefing. Seven different SBE activities completed by students were recorded: creating a comprehensive care plan (n = 2); nutritional diagnosis/assessment (n = 2); body composition assessment (n = 1); introducing patient to dysphagia care (n = 1); nutrition counselling session (n = 1); nutrition-focused physical examination (n = 1); and professional communications via social media (n = 1).

Outcomes measured through these types of SBE included communication skills (n = 2), nutritional care competencies (n = 2), quality of patient-care plans (n = 2), collaboration (n = 1), and engagement (n = 1). Outcomes of the included results were assessed by dietetic educators, and the settings were most often in course-based classrooms (n = 6), with one taking place in an assessment lab (n = 1). Methods of student assessment for performance in trained tasks included questionnaires/surveys (n = 3), standardized evaluations based on Integrated Competencies for Dietetic Education and Practice (n = 2) [37], course

exams/mid-terms (n = 1), pre/post student interviews (n = 1), and student self-assessment (n = 1).

Context

The distribution of included university and practicum settings across provinces and territories was Ontario (n = 4); Saskatchewan (n = 2); and Canada-wide (n = 1).

DISCUSSION

Through mapping student interactions with SBE in Canada, we confirmed that additional research is warranted. Exploring research and methods employed in settings outside of Canada [18, 24, 25] may provide insights on teaching, surveying, evaluation, and assessment practices that may be adapted to the Canadian context. This said, international similarities and differences between dietetics, dietetic education, and practice must be considered in the development of future research questions. Moreover, teacher and learner interactions with SBE have and continue to be an area of research of great interest for other health professions (e.g., nursing) [3, 9, 12, 13]. Drawing from this body of work can provide insights into research and practice approaches, standards and “best practice”, that can also be adapted to the dietetic context, although profession-specific competency must be considered.

Table 2. Gray literature database search.

Date	Database name and URL	Search strategy(s)/ words searched including (if applicable) how items were selected	# of items retrieved/ search results	# of items included in review
25th February 2022	Google.com (Advanced search)	<p><u>Boolean phrase used for search:</u></p> <p>All these words: “Nutrition” OR “Dietetics” AND “research” OR “student” OR “graduate” OR “undergraduate” OR “intern” OR “resident” OR “trainee” OR “learner” AND “simulation” OR “simulated” OR “experiential” OR “Role Play” OR “simulated learning” OR “experiential learning” OR “mannequin” OR “peer to peer” OR “peer assisted learning”</p> <p>AND Any of these words: “Knowledge” OR “experience” OR “perception”</p> <p><u>Region selected:</u> Canada</p> <p><u>Retrieval strategy:</u> Imported all results listed (8 pages of results total)</p> <p><u>Selection:</u> All results retrieved in the search were reviewed for relevance by 2 reviewers</p>	<p>74 retrieved</p> <p>70 screened after broken links removed</p>	1

Before they can apply to write the Canadian Dietetic Registration Examination, DNF students must demonstrate competencies from seven domains of practice during their education and practicum [38]. The pandemic limited the number of practical placements or internships available to dietetic students and interns, highlighting the need for flexible, creative, and person-centred pedagogy in training tomorrow’s dietitians [10]. Through using realistic scenarios, SBE allows students to develop hands-on skills in their field, including areas such as critical assessment, problem solving, communication, conflict resolution, evaluation, and management [2–4] and has been shown to decrease risk to *all* participants (e.g., patients, learners, teachers).

SBE has been an integral part of DNF education since the 1980s and provides some timely solutions for program barriers (e.g., placement access, IPE), but Canadian profession-led research is lacking. Our profession has a unique opportunity to revisit our learning objectives, activities, assessments, and evaluations, as we integrate the 2020 competencies [38]; to co-create a symbiotic relationship between research and teaching and learning, so one informs the other, and together they (and we) are stronger. Examples of questions that could be asked include:

1. *Is SBE considered psychologically safe by dietetic educators and students engaging in an anthropometric assessment laboratory?*
2. *Does a swallowing assessment simulation transfer knowledge and skills to students as effectively as practical experience with a patient in a clinical setting?*
3. *What is the effect of an interprofessional conflict resolution simulation on learners’ satisfaction, knowledge, and behaviour pre- and post-simulation?*
4. *Which professional and communication competencies are achieved through a simulated counselling session with a trained simulated patient and debrief?*

We began the paper outlining that there are differences in naming SBE and experiential learning [16, 21]. During this review, we also discussed nuances between the outcomes reported in the literature and the methods applied to measure them. For instance, perspectives, experiences, and knowledge inform point of view or perception, but perspective, experiences, and perception are not one outcome [20, 39, 40]. Words, labels, and definitions matter and vary within and between disciplines, professions, countries, and individuals [19]. In the case of this scoping review, for example, of the six peer-reviewed articles included, the journals in which they

Table 3. Characteristics of included studies (N = 7).

Study	Evidence source design	Population	Simulation-based education activities completed (concept)	Outcomes measured (concept)	Assessment setting	Method of assessment	Context
Buchholz et al. [20].	Report	Canadian dietitians; n = 382	Nutritional diagnosis	Nutrition care competencies	Course-based classroom	Questionnaire	Canada-wide
Buchholz et al. [45]	Original research study	Undergraduate and Master of Applied Nutrition Students; n = 32	Nutrition-focused physical exam, and nutrition counselling session	Nutrition care competencies	Course-based classroom	Standardized evaluations	Guelph, Ontario
Dobson et al. [39]	Original research study	Undergraduate nutrition students; n = 25 (128 total interdisciplinary participants)	Creating a comprehensive patient care plan	Quality of patient care plan	Assessment lab	Questionnaire (pre and post lab)	Saskatoon, Saskatchewan
Giroux et al. [4].	Perspectives in practice	Undergraduate nutrition students; n = 33	Nutritional assessment and introducing patient to dysphagia care	Communication and collaboration	Course-based classroom	Student self-assessment	Ottawa, Ontario
Szeto et al. [40]	Perspectives in practice	Undergraduate nutrition students; n = 172	Body composition assessment	Engagement	Course-based classroom	Survey and course-based exam	Guelph, Ontario
Tang [46]	Practice blog	Undergraduate nutrition student; n = 1	Creating a comprehensive care plan	Quality of patient care plan	Course-based classroom	Pre/post student interview	Saskatchewan
Twynstra and Dworatzek [47]	Perspectives in practice	Nutrition students; n = 48	Professional communications via social media	Communication	Course-based classroom	Standardized evaluation	Ontario

were published had categorized them as: (i) perspectives in practice (n = 3), (ii) research article (n = 2), and (iii) report (n = 1). Those categorized as “perspectives and practice” and “report” were published in the Canadian Journal of Dietetic Research and Practice (CJDPR). Upon review, the authors found this work and the work that makes it up met the requirements to qualify as original research as defined by the Government of Canada, Cochrane, and JBI [41–43]. As CJDPR is committed to publishing research to help in identifying student needs towards dietetic education and professional development [44], we ask dietetic educators to consider the language used in categorizing research, as it can impact knowledge exchange, synthesis, translation, and ultimately dietetic education.

Limitations

Two noteworthy limitations of this research, include (i) Only results available in English were included, excluding other languages (e.g., French) and potentially resulting in selection bias. Practical challenges such as time and funding constraints made the use of translation services infeasible for this project. (ii) The evidence from gray literature searches was based on publicly available websites; thus, it is possible that there is more evidence available than we were able to access.

IMPLICATIONS FOR RESEARCH AND RELEVANCE TO DIETETIC PRACTICE

Through sharing this work, we aim to contribute to and stimulate discussion and research, and to support those applying for funding for future research. By better understanding DNF students' interaction with SBE and other teaching methods, dietetic educators can better assess whether students' perceived and actual learning objectives are being met. Current research focuses significantly on student experience, confidence, and satisfaction, while there are limited data on evaluation of simulation as an educational activity (meeting teaching and learning outcomes) and in meeting competencies. Additional surveying of students, interns, educators, and dietitians is warranted, and subsequent mapping and synthesis.

Acknowledgements

We acknowledge the intellectual contributions of the *University-Based Nutrition Programs Experiential Learning Working Group*, including Sarah O'Brien, and dietetic educators at St. Francis Xavier University, Mount Saint Vincent University (MC, AM YZ AH, JFA, DL, SG), and Acadia University. Contributions to the grant applications that made this work possible were made by several dietetic educators at Mount Saint Vincent University, St. Francis Xavier University and Acadia University, all members of *University-Based Nutrition Programs Experiential Learning Working Group*. Also, relevant to acknowledge, are the contributions of Dalhousie University's Centre for Collaborative Clinical

Learning and Research (C3LR), current director Noel Pendergast, and co-authors (KH, KL).

Guided by the principal(s) co-conceptualized by Dr. Elder Albert Marshall including knowledge gardening (growing forward), co-learning, and the gift of multiple perspectives, dietetic educators, in Nova Scotia, established the *University-Based Nutrition Programs Experiential Learning Working Group* in 2020, a community of practice (CoP), with the goal of exchanging knowledge, skills, and strategies related to experiential learning, including simulation-based education.

Finally, we would also like to extend special thanks to YYZ's MSc Supervisor, Dr. Anna Kate Shoveller, Department of Animal Biosciences (ABSc), University of Guelph, for allowing her to complete work on this manuscript post-graduation (BSc), Department of Applied Human Nutrition, Mount Saint Vincent University.

Sources of financial support: Funding to conduct in this review was provided by Mount Saint Vincent University Committee on Research and Publications' (CRP) and Nova Scotia Department of Labour and Advanced Education.

Conflicts of interest: The authors declare no conflict of interest.

REFERENCES

- Urban Dictionary. A Thing [Internet]. Urban Dictionary. 1999 [cited 2022 Oct 20]. Available from: <https://www.urbandictionary.com/define.php?term=a%20thing>.
- Steadman R, Coates W, Huang Y, Matevosian R, Larmon BR, McCullough et al. Simulation-based training is superior to problem-based learning for the acquisition of critical assessment and management skills. *Crit Care Med*. 2006;34:151–157. PMID: 16374169. doi: 10.1097/01.CCM.0000190619.42013.94.
- Asal V, Blake E. Creating Simulations for Political Science Education. *J Political Sci Educ*. 2006;2:1–18. doi: 10.1080/15512160500484119.
- Giroux I, Pauzé E, Rosa M. Apprentissage par simulation : activité novatrice de formation interprofessionnelle sur la gestion de la dysphagie. *Can J Diet Pract Res*. 2020;81:44–48. PMID: 31081679.
- Andonova L, Mendoza-Castro R. The next climate treaty? Pedagogical and policy lessons of classroom negotiations. *Int Stud Perspect*. 2008;9:331–347. doi: 10.1111/j.1528-3585.2008.00339.x.
- Shogor R, Lazarus M, Murray N, Diamond P, Sessions N, Zsigmond E. Virtual Transgenics: Using a Molecular Biology Simulation to Impact Student Academic Achievement and Attitudes. *Res Sci Educ*. 2012;42:875–890. doi: 10.1007/s11165-011-9216-7.
- Mariani B, Gunberg Ross J, Paparella S, Ryan Allan L. Medication Safety Simulation to Assess Student Knowledge and Competence. *Clin Simul Nurs*. 2017;13:210–216. doi: 10.1016/j.ecns.2017.01.003.
- Datta R, Upadhyay K, Jaideep C. Simulation and Its Role in Medical Education. *Med J Armed Forces India*. 2012;68:167–172. PMID: 24623932. doi: 10.1016/S0377-1237(12)60040-9.
- Lackie K, Hayward K, Ayn C, Stilwell P, Lane J, Andrews C, et al. Creating psychological safety in interprofessional simulation for health professional learners: a scoping review of the barriers and enablers. *J Interprof Care*. 2022;1–16.
- Langlois S, Xyrichis A, Daulton B, Gilbert J, Lackie K, Lising D, et al. The COVID-19 crisis silver lining: interprofessional education to guide future innovation. *J Interprof Care*. 2020;34:587. PMID: 32811213. doi: 10.1080/13561820.2020.1800606.
- Hayward K, Brown M, Pendergast N, Nicholson M, Newell J, Fancy T, et al. IPE via Online Education: Pedagogical Pathways Spanning the Distance. *J Interprof Educ Pract*. 2021;24:1–6.
- Yu J, Lee W, Kim M, Choi S, Lee S, Kim S, et al. Effectiveness of simulation-based interprofessional education for medical and nursing

- students in South Korea: a pre-post survey. *BMC Med Educ.* 2020;20:476–76. PMID: 33243233. doi: 10.1186/s12909-020-02395-9.
13. Tang L, Cao Y, Liu Z, Qian K, Liu Y, Liu Y, et al. Improving the quality of preclinical simulation training for dental students using a new digital real-time evaluation system. 2021;25:100–107.
 14. Mai J, Pilcher R, Frommelt-Kuhle M. Fostering interprofessional collaboration and critical thinking between nursing and physical therapy students using high-fidelity simulation. *J Interprofessional Educ Pract.* 2018;10:37–40. doi: 10.1016/j.xjep.2017.11.002.
 15. Nieuwoudt L, Hutchinson A, Nicholson P. Pre-registration nursing and occupational therapy students' experience of interprofessional simulation training designed to develop communication and team-work skills: A mixed methods study. *Nurse Educ Pract.* 2021;53:103073–8. doi: 10.1016/j.nepr.2021.103073.
 16. Thompson K, Gutschall M. The Time Is Now: A Blueprint for Simulation In Dietetics Education. *J Acad Nutr Diet.* 2015;115:183–194. PMID: 25636217. doi: 10.1016/j.jand.2014.12.001.
 17. International Congress of Dietetics, 1–3 September 2021, Abstract Book. *South Afr J Clin Nutr.* 2021;34:A1–A203. doi: 10.1080/16070658.2021.1968126.
 18. Mills B, Hansen S, Nang C, McDonald H, Lyons-Wall P, Hunt J, et al. A pilot evaluation of simulation-based interprofessional education for occupational therapy, speech pathology and dietetic students: improvements in attitudes and confidence. *J Interprof Care.* 2020;34:472–480. PMID: 31532268. doi: 10.1080/13561820.2019.1659759.
 19. Nadarajah S, Azim A, Yilmaz D, Sibbald M. Talking the talk in junior interprofessional education: is healthcare terminology a barrier or facilitator? *BMC Med Educ.* 2021;21:1–11. doi: 10.1186/s12909-021-02564-4.
 20. Buchholz A, Hendrickson M, Giroux J, Correa JA, Hanning R, Eisenbraun C, et al. Simulation in Learning and Using the Nutrition Care Process/Terminology: Experiences and Perceptions of Dietitians in Canada. *Can J Diet Pract Res.* 2020;81:150–153. PMID: 32495644. doi: 10.3148/cjdp-2020-010.
 21. Knight A, Baldwin C, Reiglinger D, Whelan K. Communication skills teaching for student dietitians using experiential learning and simulated patients. *J Hum Nutr Diet.* 2020;33:601–613. PMID: 32468642. doi: 10.1111/jhn.12743.
 22. Wright H, Cameron J, Wiesmayr-Freeman T, Swanepoel L. Perceived Benefits of a Standardized Patient Simulation in Pre-Placement Dietetic Students." *Education sciences* 10, no. 7 (2020): 186–. *Educ Sci.* 2020;10:186–13. doi: 10.3390/educsci10070186.
 23. Roberts S, Mullins A, Wesley G, Roblyer A, Livingston L. Elevating dietetic interns' competency and confidence through simulation using a standardized patient and objective structured clinical examination. *J Acad Nutr Diet.* 2018;118:A153–A153. doi: 10.1016/j.jand.2018.08.114.
 24. Frost J, Chipchase L, Kecskes Z, D'Cunha N, Fitzgerald R. Research in Brief: Exploring perceptions of needs for the same patient across disciplines using mixed reality: A pilot study 2020;42:21–25. *Clin Simul Nurs.* 2020;43:21–25. doi: 10.1016/j.ecns.2020.02.005.
 25. Miles A, Friary P, Jackson B, Sekula J, Braahuis A. Simulation-Based Dysphagia Training: Teaching interprofessional clinical reasoning in a hospital environment. *Dysphagia.* 2016;31:407–415. PMID: 26803776. doi: 10.1007/s00455-016-9691-0.
 26. Marshall A, Bartlett C. Two-Eyed Seeing for Knowledge Gardening. In: Peters M, editor. *Encyclopedia of Educational Philosophy and Theory.* Singapore: Springer; 2018. p. 1–7.
 27. Peters M, Godfrey C, McInerney P, et al. Chapter 11: Scoping Reviews. In: Aromataris E, Munn Z, editors. *JBIManual for Evidence Synthesis.* JBI; 2020.
 28. D'Apice E, Leary-Kelley C, Bawel-Brinkley K, Munn Z, Trico A, Khalil H, et al. Learner perceptions of interdisciplinary simulation training: the future dietetics education. *J Acad Nutr Diet.* 2013;113:A47–A47. doi: 10.1016/j.jand.2013.06.160.
 29. Newton G, Bettger W, Buchholz A, Racey M. Evidence-informed strategies for undergraduate nutrition education: A review. *Appl Physiol Nutr Metab.* 2015;40:652–661. PMID: 25962618. doi: 10.1139/apnm-2014-0368.
 30. A Guide to Knowledge Synthesis [Internet]. Government of Canada Canadian Institutes of Health Research (CIHR). 2010 [cited 2022 Nov 1]. Available from: <https://cihr-irsc.gc.ca/e/41382.html>.
 31. Munn Z, Peters M, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol.* 2018;18:1–7. doi: 10.1186/s12874-018-0611-x.
 32. Dalhousie University (DAL). Simulations and Student Learning [Internet]. Dalhousie University. [cited 2022 Oct 27]. Available from: <https://www.dal.ca/dept/elt/simulation.html>.
 33. Peters M, Marnie C, Tricco A, Pollock D, Munn Z, Alexander L, et al. Updated methodological guidance for the conduct of scoping reviews. *JBIM Evid Synth.* 2020;18:2119–2126. PMID: 33038124. doi: 10.11124/JBIES-20-00167.
 34. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol.* 2005;8:19–32. doi: 10.1080/1364557032000119616.
 35. Campbell S. Filter to Retrieve Studies Related to Canada, Canadian Provinces, and the One Hundred Largest Canadian Centres from the EBSCO CINAHL Database [Internet]. John W. Scott Health Sciences Library, University of Alberta; 2022 [cited 2022 Feb 25]. Available from: https://docs.google.com/document/d/16s3Z0Xf0E94UilGO4cf7RIJlIRb0_dD3gs_ppe7354/edit?usp=sharing.
 36. Page M, McKenzie J, Bossuyt P, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Syst Rev.* 2021;10:1–11. doi: 10.1186/s13643-021-01626-4.
 37. Partnership for Dietetic Education and Practice (PDEP). The integrated competencies for dietetic education and practice [Internet]. Partnership for Dietetic Education and Practice (PDEP); 2020 [cited 2022 Mar 4]. Available from: <https://www.pdep.ca/library/PDEP-Policies/Integrated-Competencies-For-Dietetic-Education-And.aspx>.
 38. Partnership for Dietetic Education and Practice (PDEP). PDEP-PFPN Annual Report 2021–2022 [Internet]. 2022 [cited 2022 Nov 1]. p. 1–4. Available from: [https://www.pdep.ca/getattachment/about-pdep/pdep-news/Mise-a-jour-PDEP-de-la-Covid-19-\(1\)/PDEP-Annual-Report-English-2021-2022-FINAL-\(1\).pdf.aspx?lang=en-CA](https://www.pdep.ca/getattachment/about-pdep/pdep-news/Mise-a-jour-PDEP-de-la-Covid-19-(1)/PDEP-Annual-Report-English-2021-2022-FINAL-(1).pdf.aspx?lang=en-CA).
 39. Dobson T, Cassidy J, Walker D, Proctor P, Perepelkin J. Interprofessional and intraprofessional teams in a standardized patient assessment lab. *Int J Pharm Educ.* 2007;7:159–166.
 40. Szeto H, Haines J, Buchholz A. Impact of an Optional Experiential Learning Opportunity on Student Engagement and Performance in Undergraduate Nutrition Courses. *Can J Diet Pract Res.* 2016;77:84–88. doi: 10.3148/cjdp-2015-038.
 41. Government of Canada. Glossary of Terms: Research [Internet]. 2022 [cited 2022 Oct 24]. Available from: <https://www.canada.ca/en/public-health/services/public-health-practice/skills-online/glossary-terms.html#r>.
 42. Munn Z. 2.2 Introduction to qualitative evidence and evidence-based healthcare [Internet]. JBI Global Wiki. 2022 [cited 2022 Oct 31]. Available from: <https://jbi-global-wiki.refined.site/space/MANUAL/4688126/2.2+Introduction+to+qualitative+evidence+and+evidence-based+healthcare>.
 43. The Cochrane Collaboration. Chapter 21: Qualitative evidence [Internet]. Cochrane Training. 2022 [cited 2022 Oct 31]. Available from: <https://training.cochrane.org/handbook/current/chapter-21>.
 44. Cahill N. The future of dietetics starts with education (research)! *Can J Diet Pract Res.* 2022;83–83. PMID: 36048583. doi: 10.3148/cjdp-2022-032.
 45. Buchholz A, Vanderleest K, MacMartin C, Prescod A, Wilson A. Patient simulations improve dietetics students' and interns' communication and nutrition-care competence. *Nutr Educ Behav.* 2020;52(4):377–384. doi: 10.1016/j.jneb.2019.09.022.
 46. Tang, Q. From Apprehension to Confidence: A Student's Experience with Interprofessional Education and Collaboration [Internet]. Dietitians of Canada n.d. [cited 2022 Feb 25]. Available from: <https://www.dietitians.ca/About/Blog/From-Apprehension-to-Confidence-A-Student%E2%80%99s-Experience>.
 47. Twynstra J, Dworatzek P. Use of an Experiential Learning Assignment to Prepare Future Health Professionals to Utilize Social Media for Nutrition Communications. *Can J Diet Pract Res.* 2016;77:30–34. doi: 10.3148/cjdp-2015-032.