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Assessment of dietitians' nutrition counselling self-efficacy and its positive relationship to reported skill usage

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Abstract

Background—Previous studies on nutrition counselling self-efficacy assessed small groups of dietitians in focused practice areas or evaluated the effectiveness of skills training on only a few skills. This descriptive study developed a comprehensive scale to examine self-efficacy in a large, cross-sectional sample of practising dietitians in performing various counselling skills that promote dietary behaviour changes.

Methods—A valid and reliable instrument was developed and administered through the Internet to survey dietitians in the United States from various areas of dietetics and with varying years of experience. Items included counselling self-efficacy, skill usage, and counselling-related job characteristics. Of 612 respondents, one group (n=486) conducted counselling more than 50% of their work week; the other group (n=126) less than 50%. Factor analysis was used for scale development. Independent samples *t*-tests and chi-square tests were performed for group comparisons. Correlations and multiple regression analyses further assessed the relationships among variables.

Results—The resultant unidimensional scale contained 25 items. Dietitians reported high self-efficacy scores and frequent skill usage. Those who counsel more than 50% of their work week were more likely to work in outpatient settings and private practice; reported higher self-efficacy scores, and held longer and repeated sessions. Self-efficacy scores were positively correlated with counselling-related job characteristics. Years of counselling experience and skill usage significantly predicted self-efficacy scores.

Conclusion—Dietitians perceive themselves to be highly self-efficacious in using counselling skills which may contribute positively to their professional practice. However, the relationship between counselling self-efficacy and actual performance warrants future investigation.

Keywords

self-efficacy; nutrition counselling; counselling skills

Introduction

The registered dietitian is an expert in the multifaceted field of food and nutrition, someone who knows food composition and understands the various economic, social, psychological,

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and physiological factors that influence food choices, and the relationship of these factors to health and diseases. S/he is the health care professional uniquely qualified for the role of a nutrition communicator (Hill *et al.*, 2005; Lacey & Pritchett, 2003), someone who is a skilled listener (Cant & Aroni, 2008a) and a translator of theoretical information and abstract ideas into concrete actions and practical skills for clients (Johnson, 1974).

Since the 1970's, to better understand and advance the process of nutrition counselling, dietetic professionals and researchers have characterised the role of the dietitian (Foreyt & Poston, 1998), delineated the process of nutrition counselling (Danish *et al.*, 1979), and identified essential nutrition counselling skills (Andrew, 1975). Additionally, numerous empirical studies have described dietitians' competence in using counselling skills (Cant & Aroni, 2008a), and investigated the effect of counselling courses or workshops on dietitians' communication skills (Horacek *et al.*, 2007; Newes-Adeyi *et al.*, 2004; Roach *et al.*, 1992). Although nutrition counselling literature is extensive, empirical studies have mainly focused on the effectiveness of counselling training with a limited number of dietitians. This study expands the literature by investigating the efficacy beliefs of a large sample of practising dietitians in the United States in performing a general set of counselling skills that promote behaviour change.

Self-efficacy is defined as people's beliefs in their "capabilities to organise and execute the courses of action required to manage prospective situations;" it influences "how people think, feel, motivate themselves, and act" (Bandura, 1995, p. 2). This self-referent perception of efficacy is part of the complex process that governs and mediates the interrelationship between a person's knowledge and action (Bandura, 1997). In order for individuals to be competent in performing an act, they must possess the knowledge about the act; the cognitive, social, emotional, and behavioural subskills required to execute the act; and the self beliefs to effectively use those subskills in various situations, including those involving certainty and others containing "ambiguous, unpredictable, and often stressful elements" (Bandura, 1997, p. 37). The development of efficacy beliefs mainly results from enactive mastery experiences, or authentic situations (e.g., counselling sessions) where actions occur (Bandura, 1995). As individuals repeatedly achieve successes in given circumstances, efficacy beliefs are strengthened; however, failures undermine them, especially if disappointments occur before individuals develop a steady sense of self-efficacy. Firmly established efficacy beliefs persist even in the face of occasional failures. Applying this theory to the context of nutrition counselling, in order for a dietitian to execute a particular counselling skill, s/he must possess knowledge of the skill, the procedures to use the skill, and a certain degree of confidence in his/her ability to effectively perform the skill. Dietitians' self-efficacy in applying these skills increases or diminishes over time depending on the perceived sense of success or failure associated with each counselling situation.

Counselling psychologists have long used self-efficacy theory to guide their investigation into ways to promote counsellor development (Lent *et al.*, 2003) and the process of how counsellors gain competence and confidence (Melchert *et al.*, 1996). Larson and Daniels (1998) defined *counselling self-efficacy* as a counsellor's beliefs or judgments about his/her ability to perform counselling-related behaviours or to negotiate particular clinical situations. Researchers have developed validated measures that focus specifically on basic and advanced skills used by helping professionals in one-on-one counselling sessions (Lent *et al.*, 2003). They have also examined factors that significantly influence counselling self-efficacy, including years of counselling experience (Melchert *et al.*, 1996; O'Brien *et al.*, 1997), and extent of counselling training (Lent *et al.*, 2003).

The purpose of this descriptive study was to develop a valid and reliable instrument and use it to measure dietitians' nutrition counselling self-efficacy (NCSE) and reported use of a set of counselling skills. The association between NCSE and various factors (e.g. years of counselling experience and counselling-related job characteristics) were also examined. Comparisons were made between dietitians who reported conducting nutrition counselling a majority (more than 50%) of their work week and less than 50% of their work week.

Materials and Methods

Questionnaire development

An Internet-based survey was developed using WebSurveyor (version 3.6, WebSurveyor Corp., Herndon, VA, USA) to gather self-reported information from registered dietitians. First, an extensive review of the literature was done to identify nutrition counselling skills that have been reported by dietetic professionals as essential and effective in promoting dietary behaviour changes. Clients have also reported positive counselling experiences when practitioners use these skills (Stewart *et al.*, 2008). The array of sources included peer-reviewed articles of empirical and conceptual nature, along with books written by nutrition counselling experts. Pre-existing self-efficacy scales in counselling psychology (Lent *et al.*, 2003; Larson *et al.*, 1992) were adapted to fit nutrition counselling. Sixty-four skills were generated from this process, including those most often employed for relationship-building purposes that allow dietitians to gain greater understanding and facilitate the growth of clients (Hodges & Vickery, 1989; Snetselaar, 1997). Other skills specifically involve collaboration between the client and dietitian to address problems and promote changes in clients' dietary behaviours (King *et al.*, 2002).

Next, to establish content validity of the instrument, a convenience group of expert panelists comprised of five skilled dietitians and a nutritionist, experienced and proficient in counselling and from various areas of practice, scrutinised and revised the survey items. An item was eliminated when at least four of the six panelists agreed that it was redundant or less used in their practices. Thirty skills resulted from this process. The final survey contained items about counselling skills, demographic information, and counselling-related job characteristics (total items=79). Each counselling skill contained four distinct parts: its title, a brief explanation or example of the skill, a question asking about the dietitian's confidence in using the skill, and a question about frequency of skill usage. Skill explanation or example aimed to enhance item clarity so respondents would interpret its meaning similarly. Question design and response options adhered to tested methodologies for measuring self-efficacy beliefs (Bandura, 2001; Lent *et al.*, 2003). Respondents indicated the strength of their efficacy beliefs on a unipolar scale, ranging from 0 (Not confident at all) to 9 (Highly confident), in response to each question framed as "How confident are you in your *current* ability to...(perform the counselling skill)?" The question about skill usage was phrased as "During a typical week, how often do you...(perform the counselling skill)?" with four response categories: "None of the time," "Some of the time," "Most of the time," and "All of the time." Each category was transformed into a score of 0, 1, 2, and 3, respectively. A mean skill usage score was computed for each respondent.

Respondents

The target population consisted of practising dietitians throughout the United States who had access to a computer and the Internet and subscribed to one of the 41 accessible listservs (Table 1). Dietitians self-identified to be either counselling more than 50% (i.e. a majority) or less than 50% of their work week. A recruitment letter containing the web address to the informed consent and the questionnaire was distributed through these listservs. It is important to note that because these lists were not mutually exclusive, the total number of

dietitians receiving the recruitment letter and meeting the inclusion criteria could not be estimated and response rate was unable to be calculated. However, with membership in each state dietetic association ranging from 1,000 to 2,500 and specialised Dietetic Practice Group of the American Dietetic Association (2008) numbering between 2000 and 6000, survey reach was extensive.

Respondents could choose to leave their electronic mailing addresses if they were willing to participate in a follow-up survey three weeks later. These results were used to establish the test-retest reliability of the survey instrument. The follow-up survey achieved a 37% response rate (104 of 279 contacted). Completion and submission of the online survey constituted the respondent's informed consent to participate in this study approved by the [blinded for review].

Statistical analyses

Quantitative data analyses were conducted using Statistical Package for the Social Sciences (version 14, SPSS Inc., Chicago, IL, USA). Factor analysis was performed to determine the structure of the self-efficacy scale and Cronbach's alpha was calculated to confirm internal reliability. Test-retest reliability analysis used Spearman-Brown correlation coefficients to show the instruments' temporal stability. Independent samples *t*-tests were used to compare self-efficacy (SE) scores between groups of dietitians. Differences in characteristics between dietitians who counsel more and less than 50% of their work time were also investigated using chi-square tests. Correlations were drawn to study associations between NCSE and job characteristic variables. Multiple regression analyses were performed to assess the relationships among years of counselling experience, use of skills, and dietitians' NCSE.

Results

Self-efficacy scale

The 30-item survey measuring NCSE was subjected to an exploratory factor analysis using principle component factoring procedures. Eigenvalue and scree plot were used to determine the appropriate number of factors to extract. Five items with factor loading <0.60 were omitted. The final unidimensional scale was named the Dietitians' Counselling Self-Efficacy Scale (DCSES). It contained 25-items accounting for 50.7% of the total variance and exhibited internal ($\alpha=0.96$) and test-retest reliability ($r=0.94$). Table 2 shows the mean SE scores ranked in descending order for all respondents for the retained items.

Respondent characteristics

Six hundred twenty-six dietitians responded to the survey. Data from 14 respondents were excluded because of incomplete data. Final analyses thus included responses from 612 dietitians of which 486 reported spending more than 50% of their weekly work time providing individual nutrition counselling services, while 126 reported counselling less than 50% of their work week. Table 3 shows respondents' characteristics. Figure 1 indicates practice settings for each group of dietitians.

Counselling self-efficacy and skill usage

Each dietitian's SE score was calculated as a mean of the 25 items (possible score=0–9). Sample mean SE score was 7.36 ± 1.05 (range=3.28–9.00). Mean skill usage was 1.97 ± 0.48 (range=0–3). Overall, compared to dietitians who reported counselling less than 50% of their work week, those who counsel more than 50% of weekly work time were slightly older and more likely to hold a master's degree, work in outpatient settings, and be in private practice. They also reported higher SE scores and hold longer and more repeated counselling sessions with their clients.

Counselling self-efficacy and related job characteristics

Table 4 shows the significant positive correlations between SE score and each of the counselling-related job characteristics. These results also served to validate the survey instrument. Construct validity was evidenced by the significant positive correlation between dietitians' NCSE and reported use of counselling skills ($r=0.724$, $P<0.001$). Criterion-related validity was established using the known-groups approach: the more years dietitians practised nutrition counselling, the more they used the counselling skills and the higher their level of NCSE. Dietitians with counselling experience above and below the mean of 12.5 years reported significant differences ($P<0.001$) in SE score (7.70 ± 0.93 vs. 7.09 ± 1.07) and skill usage (2.07 ± 0.47 vs. 1.89 ± 0.47).

Relationships to practice setting

SE scores, use of skills, and years of counselling experience were examined between groups of dietitians who did and did not practise in a given setting. For most settings, there were no significant differences between the two groups. Only dietitians in private practice scored significantly higher in SE score (7.71 ± 0.97 vs. 7.25 ± 1.06 , $P<0.001$) and more frequently used the set of skills (2.15 ± 0.47 vs. 1.91 ± 0.46 , $P<0.001$) compared to those who did not practise in that setting. There were no significant differences between dietitians who counsel more than 50% and less than 50% of their work time by practice settings.

Predictors of counselling self-efficacy

After evaluating bivariate relationships between various factors and SE score, stepwise multiple regression analyses were conducted to further explore how significant independent variables predict SE score. The overall model that included all responses was run using the set of significant variables as predictors of SE score: use of counselling skills, years of counselling experience, group (more than 50% or less than 50% of work week), and their interaction terms (Table 5). This set of variables accounted for approximately 58% of the variance in SE score in the sample. Because the variable "group" and the three-way interaction term were significant ($P<0.01$), two separate models were run, one for each group, to investigate their differences.

For the group of dietitians who reported counselling more than 50% of their work week, both use of counselling skills and years of counselling experience were significant predictors ($P<0.001$). The significant interaction term ($P<0.001$) indicated that the relationship between use of skills and SE score was moderated by years of counselling experience; and that the relationship between years of counselling experience and SE score depended on dietitians' use of skills. The degree of positive association between the independent and dependent variables decreased as the moderating variable increased. The vertical line in Figure 2 indicates that at skill use beyond 2.3, dietitians with fewer years of counselling experience have higher SE scores than the more experienced dietitians in using this set of counselling skills. The set of predictors accounted for 60% of the observed variance in SE scores. On the other hand, for the group of dietitians who reported counselling less than 50% of their weekly work time, use of counselling skills alone predicted NCSE and explained 41% of the variance observed in SE scores. The greater the frequency of use of these skills, the higher the SE scores.

Discussion

The DCSES was found to be a dependable measure that assessed dietitians' efficacy beliefs in using counselling skills that promote dietary behaviour changes. The scale assessed counselling skills that elicit essential information from clients, enhance the collaboration between the client and the dietitian, and motivate the client to adapt more appropriate dietary

behaviours, the overarching objectives in a counselling session (Miller & Rollnick, 2002; Rosal *et al.*, 2001). Overall, dietitians in this study felt confident in their capabilities to perform various counselling skills and reported frequent skill usage. Those with SE scores in the lowest 5% were generally young, inexperienced, conducted minimal nutrition counselling during the work week, and used the skills infrequently, e.g. a 23 year-old dietitian with a bachelor's degree, one year of counselling experience, working in an inpatient setting, and spending 15 hours counselling each week and 15 minutes per session.

Although there are no similar published reports on dietitians' NCSE level for comparison, practising dietitians have previously reported feeling inadequate in using various behavioural and motivational skills (Glanz, 1979; Rapoport & Perry, 2000). These skills were also used less frequently than educational techniques (Glanz, 1979; Hauenstein *et al.*, 1987). By practice setting, this study found a significant inter-group difference in NCSE and skill use between dietitians who worked in private practice and those who did not as compared to Gilboy (1994) who found greater usage of counselling skills in dietitians working in hospital outpatient setting and private practice. Cant and Aroni (2008), on the other hand, did not find differences in dietitians' communication competence by work setting,

Other than high correlation with reported skill use, positive associations were found between dietitians' SE scores and other counselling-related job characteristics (Table 4) that corroborate past findings. Dietitians' self-efficacy in conducting cholesterol counselling significantly correlated with compliance-enhancing counselling practices (Gilboy, 1994). In addition, researchers in counselling psychology determined that counsellors with more years of experience had significantly higher counselling self-efficacy than those with less experience (Lent *et al.*, 2003; Larson *et al.*, 1992). Furthermore, hours per week devoted to diabetes patient care related positively with dietitians' self-efficacy in performing diabetes management counselling skills (Lorenz *et al.*, 2000) and number of counselling sessions significantly associated with counselling practices (Gilboy, 1994).

Bandura's self-efficacy theory (1997) describes a reciprocal relationship between a person's self-efficacy and behaviours. This is consistent with the high mean SE score and skill usage in the present study which in which 79% of the dietitians spent more than half of their work time conducting nutrition counselling. More time means more opportunities to use, refine, and master the counselling skill set, and this, along with the observed association among dietitians' NCSE, reported skill usage, and years of counselling experience probably contributed to the high SE score. Capable dietitians with higher levels of NCSE are more likely to persist in performing the counselling skills; and mastery moments, ones that they judge to be instances where they satisfactorily used the skills, would consequently contribute to their NCSE. While dietitians in private practice may use these skills more frequently and extensively, it is also likely that those who feel most confident about their counselling capabilities would choose to practise independently. The nature of working in outpatient settings for these dietitians may allow for more in-depth counselling sessions than conditions faced by dietitians working in hospital settings, where client-centred counselling is hindered (Schiller *et al.*, 1998).

In addition to the positive relationships among NCSE, skills use, and years of counselling experience in the dietitians who counsel more often, frequency of mastery experiences also appeared to play a role as evidenced by the diminished moderating effect of years of counselling experience with very high levels of skill use. Reported use of skills was a stronger predictor of NCSE than years of counselling experience, further supporting the importance of mastery. However, an addition factor may be a recent shift in dietetics education. Newly trained dietitians rated their nutrition counselling training more positively

than experienced dietitians because nutrition communication methods have evolved from simple information-giving techniques to a set of complex processes between the dietitian and the client (Cant & Aroni, 2008b). Directors of undergraduate dietetic education programs have also reported increased emphasis on counselling and client-centred education and behaviour change counselling as major trends in nutrition education (Horacek *et al.*, 2007; Short & Chittooran, 2004). Nonetheless, the observed high SE score may be due to the novice dietitians' overestimation of their personal attributes as students in another study were found to rate themselves significantly higher on certain counselling skills compared to their supervising dietitians (Horacek *et al.*, 2007). More generally, Dunning and colleagues (2004) have concluded that individuals' self-assessments of skill and expertise are often substantively and systematically flawed, especially those of beginners (Kruger & Dunning, 1999).

This study used a cross-sectional design, so a causal relationship among the different variables cannot be guaranteed even though NCSE and use of counselling skills influence each other reciprocally (Bandura, 1997). Based on the results of this study alone, the DCSSES cannot be used to predict dietitians' actual counselling behaviours, their competency, or the effectiveness of their counselling sessions. Additionally, the results are limited to explaining dietitians' self-efficacy in using the specific set of skills selected. While the 30 counselling skills chosen may not be an all-inclusive list of skills dietitians use during counselling sessions, they were deemed essential by the expert panel.

Furthermore, the reported use of these counselling skills is an estimate over an average week. It is insufficient for evaluating the appropriateness of usage, since skill use also depends on the dietitian's judgment of the counselling situation and clients' disease states. They may not report using them consistently and continuously, because it would not be sensible to use the entire set of counselling skills in every situation. Certain skills may not be suitable to use when counselling patients with serious acute conditions that require major and immediate behaviour change, e.g. food allergies and intolerances.

Finally, as the study was based on self-reported data, there is a possibility of a social desirability bias (DeVellis, 2003) although this would be minimised in the dataset because of the anonymous nature of the online survey. Caution should be exercised in generalising these results as the sample may not be representative of the universe of practising dietitians. The recruitment process and the survey itself limited the study population to dietitians who had computer and Internet access and were technologically-competent to complete the questionnaire. The self-selected group of dietitians who responded perhaps found this research more relevant to their work, had heightened personal interest in counselling, and was more well-trained and highly-skilled in this area.

The DCSSES is a valid and reliable scale that can be used to assess dietitians' self-efficacy in using a set of counselling skill. Replicating the study to include more dietitians with varying levels of counselling experience and skills is likely to enhance the generalisability of results and further explicate the construct of NCSE. As people's self-efficacy is behaviour-specific and context-dependent (Bandura, 1997), future studies might also modify the questionnaire to survey dietitians working with specific target audiences, e.g. those in different stages of the life cycle or clients with a particular disease. Additionally, future research could apply the self-efficacy theory to explore other factors and experiences that influence NCSE and assist the profession in incorporating those components into dietetics education. They may include continuing education or post-graduate training (Lent *et al.*, 2003; Melchert *et al.*, 1996), feedback from trainers (Horacek *et al.*, 2007) and peers (Daniels, 1997), and personality trait and emotions (Larson *et al.*, 1992). It would also be beneficial to explore with greater specificity the causes of positive or negative counselling experiences to

pinpoint *how* they affect the development of NCSE (Gist & Mitchell, 1992). Finally, it will be important to investigate the relationship between dietitians' NCSE and actual performance (Kruger & Dunning, 1999). Alternative methods might include direct observation of an actual or mock counselling session by trained raters or counsellors' supervisors (Horacek *et al.*, 2007; King *et al.*, 2002).

Over the years the public has demanded “greater need for help and counsel, and greater interest in diet and nutrition” (Jarratt & Mahaffie, 2002, p. S1821). Dietitians in this study showed high confidence in using various nutrition counselling skills. Although their NCSE varied according to their education level and practice settings, it was fundamentally due to differences in the extent they used the skills, the years of their counselling experience, and whether they spend a majority of their work time conducting nutrition counselling. With obesity being a major public health epidemic, dietitians are charged with the difficult task to assist clients in modifying their dietary behaviours. They will continue to acquire and develop counselling skills and self-efficacy to better meet the public's demands and improve people's health and overall quality of life.

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References

- American Dietetic Association. Dietetic Practice Groups. 2008 [(accessed on 28 March 2008)]. Available at: http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/career_481_ENU_HTML.htm
- Andrew BJ. Interviewing and counseling skills: techniques for their evaluation. *J. Am. Diet. Assoc.* 1975; 66:576–580. [PubMed: 1151017]
- Bandura, A. Exercise of personal and collective efficacy in changing societies. In: Bandura, A., editor. *Self-Efficacy In Changing Societies*. Cambridge University Press; New York: 1995. p. 1-45.
- Bandura, A. *Self-Efficacy: The Exercise of Control*. W.H. Freeman and Company; New York: 1997.
- Bandura, A. Guide for constructing self-efficacy scales (Revised). 2001. Available from Frank Pajares, Emory University
- Cant RP, Aroni RA. Exploring dietitians' verbal and nonverbal communication skills for effective dietitian–patient communication. *J. Hum. Nutr. Diet.* 2008a; 21:502–511. [PubMed: 18631285]
- Cant RP, Aroni RA. From competent to proficient; nutrition education and counseling competency dilemmas experienced by Australian clinical dietitians in education of individuals. *Nutrition & Dietetics*. 2008b; 65:84–89.
- Daniels, JA. PhD dissertation. University of Nebraska; Lincoln, NE: 1997. The influence of performance feedback and causal attributions upon ratings of counseling self-efficacy.
- Danish SJ, Ginsberg MR, Terrell A, Hammond MI, Adams SO. The anatomy of a dietetic counseling interview. *J. Am. Diet. Assoc.* 1979; 75:626–630. [PubMed: 512273]
- DeVellis, RF. *Scale Development: Theory and Applications*. 2nd ed.. Sage Publications; Thousand Oaks, CA: 2003.
- Dunning D, Heath C, Suls JM. Flawed self-assessment. *PSPI*. 2004; 5:69–106.

- Foreyt JP, Poston WSC. The role of the behavioral counselor in obesity treatment. *J. Am. Diet. Assoc.* 1998; 98(suppl):S27–S30. [PubMed: 9787733]
- Gilboy MBR. Multiple factors affect dietitians' counseling practices for high blood cholesterol. *J. Am. Diet. Assoc.* 1994; 94:1278–1283. [PubMed: 7963172]
- Gist ME, Mitchell TR. Self-efficacy: a theoretical analysis of its determinants and malleability. *Acad. Manage. Rev.* 1992; 17:183–211.
- Glanz K. Strategies for nutritional counseling. *J. Am. Diet. Assoc.* 1979; 74:431–437. [PubMed: 429718]
- Hauenstein DJ, Schiller MR, Hurley RS. Motivational techniques of dietitians counseling individuals with Type II diabetes. *J. Am. Diet. Assoc.* 1987; 87:37–42. [PubMed: 3794131]
- Hill JO, Thompson H, Wyatt H. Weight maintenance: what's missing? *J. Am. Diet. Assoc.* 2005; 105(suppl):S63–S66. [PubMed: 15867898]
- Hodges, PAM.; Vickery, CE. *Effective Counseling: Strategies for Dietary Management*. Aspen Publishers; Frederick, MD: 1989.
- Horacek TM, Salomon JE, Nelsen EK. Evaluation of dietetic students' and interns' application of a lifestyle-oriented nutrition-counseling model. *Patient Educ. Couns.* 2007; 68:113–120. [PubMed: 17524592]
- Jarratt J, Mahaffie JB. Key trends affecting the dietetics profession and the American Dietetic Association. *J. Am. Diet. Assoc.* 2002; 102(suppl):S1821–1839.
- Johnson D. The dietitian—a translator of nutritional information. *J. Am. Diet. Assoc.* 1974; 64:608–611. [PubMed: 4598653]
- King EB, Schlundt DG, Pichert JW, Kinzer CK, Backer BA. Improving the skills of health professionals in engaging patients in diabetes-related problem solving. *The Journal of Continuing Education in the Health Professions.* 2002; 22:94–102. [PubMed: 12099125]
- Kruger J, Dunning D. Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. *J. Pers. Soc. Psychol.* 1999; 77:1121–1134. [PubMed: 10626367]
- Lacey K, Pritchett E. Nutrition care process and model: ADA adopts road map to quality care and outcomes management. *J. Am. Diet. Assoc.* 2003; 103:1061–1072. [PubMed: 12891159]
- Laquatra I, Danish SJ. Effect of a helping skills transfer program on dietitians helping behavior. *J. Am. Diet. Assoc.* 1981; 78:22–27. [PubMed: 7217556]
- Larson LM, Daniels JA. Review of the counseling self-efficacy literature. *The Counseling Psychologist.* 1998; 26:179–218.
- Larson LM, Suzuki LA, Gillespie KN, Potenza MT, Bechtel MA, Toulouse AL. Development and validation of the counseling self-estimate inventory. *J. Couns. Psychol.* 1992; 39:105–120.
- Lent RW, Hill CE, Hoffman MA. Development and validation of the Counselor Activity Self-Efficacy Scales. *J. Couns. Psychol.* 2003; 50:97–108.
- Lorenz R, Gregory RP, Davis DL. Utility of a brief self-efficacy scale in clinical training program evaluation. *Eval. Health. Prof.* 2000; 23:182–193. [PubMed: 10947524]
- Melchert TP, Hays VL, Wiljanen LM, Kolocek AK. Testing models of counselor development with a measure of counseling self-efficacy. *Journal of Counseling and Development.* 1996; 74:640–644.
- Miller, WR.; Rollnick, S. *Motivational Interviewing: Preparing People for Change*. 2nd ed.. The Guilford Press; New York: 2002.
- Newes-Adeyi G, Helitzer DL, Roter D, Caufield LE. Improving client-provider communication: evaluation of a training program for women, infants and children (WIC) professionals in New York State. *Patient Educ. Couns.* 2004; 55:210–217. [PubMed: 15530756]
- O'Brien KM, Heppner MJ, Flores LY, Bikos LH. The Career Counseling Self-Efficacy Scale: instrument development and training applications. *J. Couns. Psychol.* 1997; 44:20–31.
- Pace PW, Russell ML, Probstfield JL, Insull W. Intervention specialist: new role for dietitians' counseling skills. *J. Am. Diet. Assoc.* 1984; 84:1357–1360. [PubMed: 6491116]
- Rapoport L, Perry N. Do dietitians feel that they have had adequate training in behavior change methods? *J. Am. Diet. Assoc.* 2000; 13:287–298.

- Roach RR, Pichert JW, Stetson BA, Lorenz RA, Boswell EJ, Schlundt DG. Improving dietitians' teaching skills. *J. Am. Diet. Assoc.* 1992; 92:1466–1473. [PubMed: 1452959]
- Rosal MC, Ebbeling CB, Lofgren I, Ochene JK, Ockene I, Hebert JR. Facilitating dietary change: the patient-centered counseling model. *J. Am. Diet. Assoc.* 2001; 101:332–338. [PubMed: 11269614]
- Schiller MR, Miller M, Moore C, Davis E, Dunn A, Mulligan K, Zeller P. Patients report positive nutrition counseling outcomes. *J. Am. Diet. Assoc.* 1998; 98:977–982. [PubMed: 9739796]
- Short JE, Chittooran MM. Nutrition education: a survey of practices and perceptions in undergraduate dietetics education. *J. Am. Diet. Assoc.* 2004; 104:1601–1604. [PubMed: 15389422]
- Snetselaar, LG. *Nutrition Counseling Skills for Medical Nutrition Therapy*. Aspen Publishers; Frederick, MD: 1997.
- Soresi S, Nota L, Lent RW. Relation of type and amount of training to career counseling self-efficacy in Italy. *The Career Development Quarterly*. 2004; 52:194–201.
- Stewart L, Chapple J, Hughes AR, Poustie V, Reilly JJ. The use of behavioural change techniques in the treatment of paediatric obesity: qualitative evaluation of parental perspectives on treatment. *J. Hum. Nutr. Diet.* 2008; 21:464–473. [PubMed: 18647212]

Figure 1.

Practice settings^a for dietitians who counsel more than 50% and less than 50% of their work week.

Difference between dietitians who counsel >50% and <50% of their work time: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

^aSurvey allowed multiple selection of practice settings, thus totals do not sum to 100%.

Figure 2.
The relationship between reported use of counselling skills and SE score is moderated by years of counselling experience.

Table 1

Listserves through which recruitment letters were distributed.

1	American Dietetic Association's central online networking forum (n=1)
2	State/district dietetic associations (n=31): Alabama, Alaska, Arizona, Arkansas, California-San Jose Peninsula District, Colorado, Connecticut, Delaware, Georgia, Hawaii, Idaho, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Dakota, Tennessee, West Virginia, Wisconsin, Washington, DC
3	Dietetic Practice Groups (n=7): Clinical Nutrition Management; Consultant Dietitians in Health Care Facilities; Diabetes Care and Education; Dietitians in Nutrition Support; Nutrition Entrepreneurs; Sports, Cardiovascular and Wellness Nutritionists; Weight Management
4	Dietitians in private practice (n=2)

Table 2

Self-efficacy score for each item in the DCSSES for all respondents and those who counsel more than 50% and less than 50% of their work week.

Nutrition Counselling Skill	Self-Efficacy Score Mean (SD)		
	All	More than 50%	Less than 50%
Use nonverbal cues to convey empathy, warmth and support toward your clients **	7.97 (1.20)	8.06 (1.14)	7.61 (1.34)
Provide relevant data, facts and resources to your clients	7.91 (1.18)	7.95 (1.16)	7.77 (1.23)
Listen attentively in order to understand your clients' messages and feelings	7.88 (1.11)	7.91 (1.12)	7.77 (1.08)
Explore your clients' reasons for seeking nutrition counselling ***	7.83 (1.27)	7.93 (1.22)	7.42 (1.39)
Define with your clients clear and concise goals that are measurable and behaviour-focused **	7.68 (1.47)	7.76 (1.42)	7.37 (1.62)
Collaborate with your clients to establish mutual goals tailored to their circumstances *	7.62 (1.31)	7.67 (1.30)	7.40 (1.31)
Collaborate with your clients to identify triggers of undesirable eating behaviours **	7.54 (1.43)	7.64 (1.33)	7.13 (1.70)
Collaborate with your clients to identify barriers to dietary behaviour change	7.51 (1.34)	7.54 (1.35)	7.40 (1.30)
Assess your clients' perceptions, feelings and attitudes regarding their past experiences with dietary behaviour changes **	7.45 (1.41)	7.54 (1.36)	7.08 (1.52)
Attend to and interpret your clients' nonverbal messages *	7.43 (1.43)	7.49 (1.43)	7.19 (1.41)
Foster the abilities of your clients to recognise their own strengths	7.41 (1.42)	7.46 (1.43)	7.21 (1.38)
Explore with your clients the pros and cons of their current dietary behaviours *	7.40 (1.46)	7.47 (1.47)	7.14 (1.38)
Elicit more elaborate responses from your clients **	7.34 (1.56)	7.42 (1.56)	7.01 (1.54)
Confirm the accuracy of your understanding of your clients' messages and feelings when you are in doubt *	7.29 (1.47)	7.37 (1.44)	7.00 (1.55)
Collaborate with your clients to identify non-food rewards or ways to foster the dietary behaviour change	7.25 (1.58)	7.30 (1.52)	7.07 (1.79)
Discuss and evaluate with your clients the psychosocial, socioeconomic, functional, and behavioural factors related to their dietary behaviours **	7.24 (1.62)	7.34 (1.59)	6.85 (1.69)
Evaluate your clients' readiness to learn *	7.24 (1.45)	7.30 (1.42)	6.98 (1.52)
Help your clients identify possible sources of social support	7.18 (1.50)	7.24 (1.46)	6.96 (1.61)
Identify and address your clients' irrational beliefs when encountered	7.14 (1.65)	7.21 (1.60)	6.85 (1.84)
Identify and address any discrepancies and contradictions in your clients' messages	7.09 (1.64)	7.11 (1.66)	7.02 (1.55)
Determine with your clients appropriate methods of self-monitoring *	7.07 (1.58)	7.15 (1.56)	6.75 (1.64)
Determine when to stop giving information to your clients so to not overwhelm them	7.05 (1.65)	7.04 (1.65)	7.09 (1.65)
Clarify to your clients the roles and responsibilities of the dietitian-client relationship *	7.03 (1.76)	7.10 (1.79)	6.75 (1.61)
Evaluate your clients' perceptions of their abilities to make dietary behaviour changes *	7.03 (1.54)	7.11 (1.54)	6.72 (1.54)
Use silence to allow your clients time to get in touch with their thoughts and feelings	6.42 (1.96)	6.44 (1.97)	6.33 (1.92)

Difference between dietitians who counsel >50% and <50% of their work time:

* $P < 0.05$

** $P < 0.01$

*** $P < 0.001$

Table 3

Characteristics for all respondents and those who counsel more than 50% and less than 50% of their work week.

		All	More than 50%	Less than 50%
Number of Respondents (%)		612	486	126
	Female	602 (98.4)	477 (98.1)	125 (99.2)
	Male	10 (1.6)	9 (1.9)	1 (0.8)
Age (years) *		41.3 (11.5)	41.8 (11.3)	39.2 (11.8)
Education Level (n, %)				
	Bachelor's	289 (47.2)	222 (45.7)	67 (53.2)
	Master's *	307 (50.2)	255 (52.5)	52 (41.3)
	Doctoral *	16 (2.6)	9 (1.9)	7 (5.6)
Counselling-Related Job Characteristics				
	Self-efficacy score **	7.36 (1.05)	7.42 (1.04)	7.12 (1.06)
	Use of counselling skills	1.97 (0.48)	2.00 (0.45)	1.90 (0.58)
	Length of counselling experience (years)	12.5 (9.7)	12.7 (9.5)	11.5 (10.4)
	Amount of time spent on counselling (hr/ wk) ***	19.3 (11.2)	21.8 (10.3)	8.4 (7.6)
	Number of sessions (session/client) ***	4.6 (7.1)	4.2 (3.5)	2.8 (3.2)
	Length of counselling session (min/ session) ***	44.4 (18.7)	46.3 (16.9)	36.1 (19.9)

Data are presented as mean (SD) unless otherwise indicated.

Difference between dietitians who counsel >50% and <50% of their work time:

* $P < 0.05$

** $P < 0.01$

*** $P < 0.001$

Table 4

Pearson correlations (r) between self-efficacy score and counselling-related job characteristics for all respondents and those who counsel more than 50% and less than 50% of their work week.

	All	More than 50%	Less than 50%
Use of counselling skills	0.72***	0.75***	0.65***
Years of counselling experience	0.31***	0.32***	0.25**
Hours of counselling per week	0.20***	0.15**	0.23**
Sessions per client	0.17***	0.16***	0.13
Minutes per session	0.13***	0.10*	0.14

*
P<0.05

**
P<0.01

P<0.001.

Table 5

Multiple regression analysis with self-efficacy score as dependent variable and reported use of counselling skills, years of counselling experience, group (more than 50% or less than 50% of weekly time spent on counselling), and their interaction terms as independent variables. Two final models by group.

	All		More than 50%		Less than 50%	
	B±SE ^a	β	B±SE ^a	β	B±SE ^a	β
Constant	5.07±0.32***		3.21±0.22***		4.86±0.25*	
Use of skill	1.00±0.17***	0.45	2.01±0.11***	0.86	1.19±0.13***	0.65
Year experience	-0.01±0.02	-0.10	0.07±0.01***	0.63		
Group	-1.86±0.39***	-0.72				
Use*Year	0.01±0.01	0.24	-0.03±0.01***	-0.52		
Use*Group	1.01±0.20***	0.86				
Year*Group	0.08±0.03**	0.76				
Use*Year*Group	-0.04±0.01**	-0.77				
Adjusted R ²	0.58		0.60		0.41	

^aB±SE=regression coefficient ± standard error.

* P<0.05

** P<0.01

*** P<0.001