

# Nutrition Risk in Home-Bound Older Adults: Using Dietician-Trained and Supervised Nutrition Volunteers for Screening and Intervention\*

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## RÉSUMÉ

Le dépistage du risque nutritionnel et l'intervention hâtive en nutrition auprès de la population âgée confinée à domicile sont des déterminants clés de la prévention de divers problèmes de santé et d'incapacités physiques chez cette population. Cette étude pilote avait pour objectifs: (a) de mesurer la fidélité de l'instrument de mesure « Questionnaire de dépistage nutritionnel des aînés » (ENS<sup>©</sup>) lorsqu'administré par une nutritionniste et par un bénévole formé; et (b) d'explorer la faisabilité pour un bénévole de faire du dépistage et de l'intervention en nutrition auprès d'une population âgée confinée recevant des services de soutien à domicile. Les participants ( $n = 29$ ) et les bénévoles ( $n = 15$ ) étaient des personnes âgées vivant dans la communauté. Les bénévoles ont rencontré les participants, ont évalué leur risque nutritionnel à partir de l'échelle de dépistage ENS<sup>©</sup>, ont offert de l'éducation nutritionnelle, et ont développé et aidé à l'implantation des plans d'intervention nutritionnelle. Afin de calculer la fidélité inter juges du ENS<sup>©</sup>, les résultats obtenus à partir de cet instrument par les bénévoles et par la nutritionniste ont été comparés. Le pourcentage de concordance était élevé (80 %) pour la plupart des items, mais plus élevé *parmi* les bénévoles qu'*entre* les bénévoles et la nutritionniste. Nous croyons que des bénévoles formés au sujet de la nutrition peuvent épauler les nutritionnistes pour le dépistage et l'éducation des risques nutritionnels, mais que l'intervention nutritionnelle devrait être réservée aux professionnels.

## ABSTRACT

Nutrition screening and early intervention in home-bound older adults are key to preventing unfavourable health outcomes and functional decline. This pilot study's objectives were (a) to test the reliability of the Elderly Nutrition Screening Tool (ENS<sup>©</sup>) when administered by dietician-trained and supervised nutrition volunteers, and (b) to explore the feasibility of volunteers' doing nutrition screening and intervention for home-bound older adults receiving home care services. Both participating clients ( $n = 29$ ) and volunteers ( $n = 15$ ) were community-dwelling older adults. Volunteers met with participating clients, assessed nutritional risk with the ENS<sup>©</sup>, provided nutritional education, and developed and helped implement intervention plans. To assess ENS<sup>©</sup> inter-rater reliability, we compared results obtained by nutrition volunteers and a dietician. Agreement was high (80%) for most items but was higher *among* volunteers than *between* volunteers and the dietician. We conclude that nutrition volunteers can assist in screening and educating older adults regarding nutritional risks, but intervention is best left to professionals.

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Maintaining adequate nutritional status in older adults can help ensure quality of life and positive health outcomes, thereby reducing health care costs (Posner, Jette, Smith, & Miller, 1993; Saffel-Shrier & Athas, 1993; Wellman, Weddle, Kranz, & Brain, 1997), such as longer hospitalizations. Increasingly, evidence shows that factors at both the individual and environmental levels influence the nutritional status of older adults (McIntosh, Kubena, Walker, Smith, & Landmann, 1990; Payette, Gray-Donald, Cyr, & Boutier, 1995; Payette & Shatenstein, 2005; Shatenstein, Nadon, & Ferland, 2004).

While adequate nutritional status is associated with good health, reduced nutritional status in older individuals, whether hospitalized (Abbasi & Rudman, 1993; Kerstetter, Holthausen, & Fitz, 1992; Sullivan & Walls, 1994) or at home (Millen et al., 2001; Sharkey, 2002, 2003), has been linked to functional decline (Stuck et al., 1999), hip fractures (Langlois et al., 1998), institutionalization (Jensen, Friedmann, Coleman, & Smiciklas-Wright, 2001; Payette, Coulombe, Boutier, & Gray-Donald, 2000), morbidity, and mortality (Cornoni-Huntley et al., 1991; Liu, Bopp, Roberson, & Sullivan, 2002; Payette, Coulombe, Boutier, & Gray-Donald, 1999; Sullivan & Walls, 1998). The link between functional limitations and reduced nutritional status has led to concerns about some of the frailer community-dwelling older adults, often home-bound. Home-bound older adults are confined to their homes due to physical or psychological problems that may be temporary or chronic. Several studies found a high prevalence of inadequate dietary intakes and diet-related illnesses in home-bound older adults, thereby increasing their risks for nutritional deficiencies (Frongillo, Rauschenbach, Roe, & Williamson, 1992; Millen et al., 2001; Payette et al., 1995; Sharkey, 2002, 2003). There is also a striking prevalence of involuntary weight loss due to malnutrition among community-dwelling older persons with functional dependencies (27%) compared with those who are independent (<10%; Alibhai, Greenwood, & Payette, 2005). Weight loss is a

well-recognized warning sign for under-nutrition (Newman et al., 2005).

This evidence demonstrates the need to screen for insufficient food intake among the frail community-dwelling older-adult population and to define optimal strategies, both at the individual and environmental levels. Nutrition screening and early intervention in home-bound older adults are key in the prevention of unfavourable health outcomes and functional decline (Payette, Guigoz, & Vellas, 1999; Saffel-Shrier & Athas, 1993). In fact, previous studies (Abbasi, Basu, & Rudman, 1992; Shizgal, Martin, & Gimmon, 1992) have shown that established under-nutrition is much more difficult to reverse in older adults than in younger adults, reinforcing the need to begin providing nutritional assistance rapidly for individuals at high nutritional risk. In Quebec, whenever possible, older adults with identified nutritional risks (e.g., lack of accessibility to food, sudden weight loss, etc.) are assigned a case manager from the home care services department of a local community health centre (CLSC), to ensure the provision of appropriate services. CLSCs and community organizations offer a range of such services, including help with grocery shopping, cooking, and feeding, in addition to Meals on Wheels and consultations with a dietician. Such services improve both energy and nutrient intake in this population (Roy & Payette, 2006). However, high nutritional risk remains undetected among many older adults, and thus they do not receive the nutritional services they require. More outreach and earlier detection are needed in order to implement preventive measures.

The Elderly Nutrition Screening (ENS<sup>®</sup>) tool was developed in Quebec to identify individuals at nutritional risk and allow for immediate nutritional intervention (Payette, Hébert, Boutier, & Voyer, 1997; Payette, 2005). The ENS<sup>®</sup> is a short, easy-to-use, multi-item questionnaire that includes significant and independent risk factors of inadequate food intake (Payette et al., 1995). A total score is calculated and clear recommendations are provided for three

nutritional risk levels (low, moderate, high; see [www.dietitians.ca/seniors/content/other/clsc\\_overview.asp](http://www.dietitians.ca/seniors/content/other/clsc_overview.asp)). The ENS<sup>®</sup> has a demonstrated validity and reliability when used by Quebec CLSC home care workers (Payette, 1996).

This project investigated whether older-adult volunteers could reliably use the ENS<sup>®</sup> to screen older home care clients for nutritional risk and then recommend appropriate nutritional interventions. It also explored whether nutrition volunteers could provide basic nutrition education during their visits with older clients. Therefore, the objectives of the study were (a) to test the inter-rater reliability of the ENS<sup>®</sup> when used by older adult nutrition volunteers, and (b) to explore the feasibility of a nutrition education intervention that includes nutrition screening carried out by older adult volunteers.

## Method

### Design

Inter-rater reliability was tested by administering the ENS<sup>®</sup> on two occasions, 1 week apart, using two types of rater pairs: (a) two older adult nutrition volunteers, and (b) a dietician and an older adult volunteer. The study also explored the feasibility of staffing a nutritional intervention with older adult nutrition volunteers under the supervision of a dietician and the case managers of clients participating in the study. Approval was obtained from the CLSC René-Cassin Ethics Committee, and all participating clients signed an informed consent form.

### Intervention

The Cummings Jewish Centre for Seniors is a vibrant community centre for Montrealers over the age of 50 and offers a wide range of cultural, educational, recreational, and advocacy services to members aged 50 years and over. It also operates a network of services for frail older adults. The organization was interested in offering a new nutritional service to its oldest members.

The pilot intervention consisted of nutrition volunteers' meeting with participating clients in their homes, assessing their nutritional risks, providing nutritional education, developing intervention plans, and providing follow-up. A dietician developed a guide and trained the nutrition volunteers. Two 3-hour group-training sessions were given 1 week apart during the month preceding the official start of the intervention. The intervention consisted of a pre-visit and three subsequent home visits. During the pre-visit, the dietician or a nutrition volunteer administered the ENS<sup>®</sup>. During visit 1, one week

after the pre-visit, a nutrition volunteer (not the same one as the nutrition volunteer at the pre-visit, if applicable) administered the ENS<sup>®</sup> and provided a 30-minute nutritional education session using a pamphlet prepared by the dietician and *Canada's Guide for Healthy Eating*. Prior to visit 2, the nutrition volunteer scored the ENS<sup>®</sup> and selected one of three ENS<sup>®</sup> intervention plans, depending on risk level (*low, moderate, high*). The project dietician had adapted these plans according to the services available locally and listed on each plan the services recommended for each level of risk (e.g., Meal-on-Wheels, meeting with a dietician, assistance with feeding, etc.). Thus a nutrition volunteer simply had to indicate which new services should be proposed to the client. The nutrition volunteer then met with the dietician for discussion and approval of the intervention plan. During visit 2, which took place 1 week after visit 1, the plan was reviewed and approved by the client and then brought to the case manager, who quickly implemented the appropriate nutrition intervention. The third visit was conducted 3 weeks after the start of the intervention. During this visit, the nutrition volunteer and the client reviewed the services in the plan already implemented by the case manager and discussed whether they wanted any additional services (Table 1).

### Participating Clients

A convenience sample was recruited in Montreal through the seniors' community organization (Cummings Jewish Centre for Seniors—CJCS) and the CLSC René-Cassin. Twelve case managers identified clients who (a) were aged 60 years or older, (b) had no significant cognitive impairments according to the multi-clientele grid (the validated home care assessment instrument used by the CLSCs; e.g., memory, judgement, behaviour, etc.), (c) spoke English or French, and (d) were living in the community. In total, 35 clients began the study and 29 completed it: 3 were not interested in continuing, 2 were unreachable, and 1 moved to a seniors' residence.

**Table 1: Study design**

Week 1: Pre-visit	—ENS <sup>®</sup> (nutrition volunteer or dietician)
Week 2: Visit 1	—ENS <sup>®</sup> + questionnaire + 30-minute nutrition education (nutrition volunteer); Development of nutritional intervention (nutrition volunteer + dietician + case manager)
Week 3: Visit 2	—Beginning of nutritional intervention (Meals on Wheels, etc.); Nutritional intervention (3 weeks)
Week 6: Visit 3	—Follow-up (nutrition volunteer); Satisfaction questionnaire, telephone interview (research coordinator)

Fifteen nutrition volunteers aged 65 years or over, 14 women and 1 man, were recruited from among members of the CJCS through advertising that specified what the volunteers' duties would be. Potential nutrition volunteers who declined to participate gave as their reasons: *no interest* ( $n=3$ ), *not enough time* ( $n=4$ ), and *health problems* ( $n=2$ ).

### Procedures

Case managers provided the names of clients who wanted to participate. The research coordinator randomly assigned participating clients to either the dietician or a nutrition volunteer for the pre-visit administration of the ENS<sup>©</sup>. For the intervention, participating clients were assigned to nutrition volunteers based on availability. During visit 1, the ENS<sup>©</sup> was readministered by a nutrition volunteer, along with a brief questionnaire to obtain data for the reliability analysis and to calculate nutritional risks. Visits 2 and 3 completed the intervention. A final telephone interview, conducted by the research coordinator, questioned participating clients about their satisfaction with the project (see Table 1).

### Instruments

Pre-selection grids and information on services currently received were provided by case managers. Socio-demographic data and health status were collected from computerized case records by the research coordinator. During visit 1, nutrition volunteers administered questionnaires that included variables such as living arrangements, social network, health status, medication, and activities of daily living (ADLs). The ENS<sup>©</sup> was administered twice to test its reliability in this setting. It had shown good reliability, with high test-retest (ICC = 0.87) and inter-rater (ICC = 0.84) correlations, in previous studies (Payette, Gray-Donald, Cyr, & Boutier, 1996). No changes were made to its format, except to convert the items from statements to questions (Table 2).

Data on the perceived feasibility of the intervention and on participant satisfaction were obtained from case managers, nutrition volunteers, participating clients, and the dietician. Finally, the adequacy of the volunteers' intervention plans (i.e., an intervention plan corresponding to the nutritional risks and needs of the clients) was assessed by the dietician when meeting with nutrition volunteers to discuss recommendations for additional services. All project materials were reviewed by an advisory committee (nutrition volunteers, the dietician, researchers, case managers, and the project coordinator).

### Statistical Analysis

Analyses of the reliability of the ENS<sup>©</sup> were performed using SPSS. Reliability was tested by comparing the results obtained 1 week apart by two raters: (a) an older adult nutrition volunteer and a dietician, or (b) two older adult nutrition volunteers. The following tests were calculated for each item: percentage of agreement, Cohen's Kappa and the adjusted Kappa (Byrt, Bishop, & Carlin, 1993; Cohen, 1968; Landis & Koch, 1977), Pearson coefficient of correlation, *t* tests, and Intraclass Correlation Coefficient (ICC; Bravo & Potvin, 1991; Fleiss, 1985). A *t* test compared the differences in scores between the administration of the ENS<sup>©</sup> by two older adult nutrition volunteers and by a dietician and a nutrition volunteer. Descriptive analyses were performed on project satisfaction and perceived feasibility.

### Results

The majority of the participating clients were women (86%) and/or single (68%), and most felt that their income was adequate or more than adequate to meet their basic needs (76%). Mean age was 82.5 years ( $SD=7.5$ ). All subjects spoke English. More than one third had heart problems and arthritis, and nearly a quarter had hypertension and respiratory and vision problems. A large proportion reported problems with their ADLs, such as washing (62%) and grooming (55%). One of their biggest difficulties was with meal preparation (66%). All participating clients were under the care of a case manager. More than 69% of participating clients required assistance with grocery shopping, while fewer reported that they received help with meal preparation (24%) or received Meals on Wheels (14% hot; 17% frozen).

### Reliability Results

Total results showed high levels of agreement for almost all items on the ENS<sup>©</sup> (80%). However, two items showed lower overall levels of agreement: having a good appetite (69%) and having experienced a recent stressful event (69%). The dietician and the nutrition volunteers agreed on the nutritional risk category for 60 per cent of participating clients. For the proportion of subjects (40%) for whom there was no agreement, nutrition volunteers estimated higher levels of nutritional risk than did the dietician, and this was true in 67 per cent of the cases. This means that 27 per cent of the client risk assessments were false positives and 13 per cent were false negatives. For the total Kappa statistics, the adjustments produced a small (0 to 0.06) to moderate improvement for most items (0.13), with the exception of *milk intake for breakfast*, where adjustment modified the total Kappa

**Table 2: Agreement between the ENS<sup>©</sup> and Kappa scores**

ENS <sup>©</sup> Question (Answer Scoring)	Percentage of Agreement between the Two Visits			Unadjusted Kappa			Adjusted Kappa (PABAK) <sup>a</sup>		
	Dietician & Vol <sup>b</sup>	Vol & Vol <sup>c</sup>	Total	Dietician & Vol <sup>b</sup>	Vol & Vol <sup>c</sup>	Total	Dietician & Vol <sup>b</sup>	Vol & Vol <sup>c</sup>	Total
	n = 15	n = 14	n = 2	n = 15	n = 14	n = 29	n = 15	n = 14	n = 29
Is the client very thin? <sup>d</sup> (Yes = 1)	86.7	92.9	89.7	0.444	0.811	0.664	0.734	0.858	0.794
Have you lost weight in the last year? (Yes = 1)	80.0	100	89.7	0.571	1.000	0.784	0.600	1.000	0.794
Do you suffer from arthritis to the point of interfering with daily activities? (Yes = 1)	93.3	71.4	82.8	0.815	0.429	0.598	0.866	0.428	0.656
With your glasses, is your vision...? (Good = 0; Med. = 1; Poor = 2)	73.3	85.7	82.7	0.483	0.889	0.724			
Have you recently suffered a stressful life event (e.g., illness/death)? (Yes = 1)	66.7	71.4	69.0	0.324	0.429	0.386	0.334	0.428	0.380
Do you have a good appetite...? (Often = 0; At times = 1; Never = 2)	73.3	71.4	69.0	0.427	0.545	0.488			
What do you USUALLY eat for breakfast?									
Fruit or fruit juice (Yes = 1)	93.3	92.9	93.1	0.762	0.837	0.812	0.866	0.858	0.862
Eggs or cheese or peanut butter (Yes = 1)	93.3	85.7	90.0	0.842	0.714	0.776	0.866	0.714	0.800
Bread or Cereal (Yes = 1)	86.7	85.7	86.9	0.444	0.417	0.426	0.734	0.714	0.738
Milk (1 cup or more than cup in coffee) (Yes = 1)	100	78.6	89.7	1.000	0.432	0.784	1.000	0.572	0.794
Nutritional risk Low Moderate High	60.0	92.9	75.9	0.300	0.870	0.561			

<sup>a</sup> PABAK Kappa adjusted for systematic bias and for unbalanced distribution—Kappa almost perfect: >0.8; imperfect: 0.6–0.8; moderate 0.4–0.6; acceptable; 0.2–0.4; low 0–0.2; poor <0 (Landis & Koch, 1977)

<sup>b</sup> Received the dietician the first visit and an older adult nutrition volunteer the second visit

<sup>c</sup> Received an older adult nutrition volunteer the first and second visits

<sup>d</sup> Nutrition volunteer's observation; not asked of the participant

from 0.43 to 0.74. The question on experiencing a stressful life event yielded the lowest Kappa, even after adjustment. Nevertheless, this can still be considered an acceptable level of agreement (Landis & Koch, 1977). For the classification of nutritional risk, the total Kappa was 0.56, which can be interpreted as moderate agreement. While the Kappa indicated an almost perfect agreement on nutritional risk category when two nutrition volunteers administered the ENS<sup>©</sup> (0.87), the agreement was low (0.30) when the two raters were a nutrition volunteer and a dietician (Table 2). However, the differences in the scores were not significantly different whether an older adult nutrition volunteer was paired with another older adult nutrition volunteer or with a dietician ( $t = 0.73$ ;  $p = 0.47$ ; see Table 3).

A lower correlation was shown in the scores obtained by nutrition volunteer–dietician pairs as compared to those obtained by nutrition volunteer–nutrition volunteer pairs. However, it rose to 0.44 ( $p = 0.10$ ) if the question “Have you recently suffered a stressful life event?” was removed, and to 0.53 ( $p = 0.04$ ) if the question “Do you have a good appetite...?” was also removed. For all rater pairs,  $t$  tests revealed no significant differences between the two scores. The ICC varied from 0.36 for the nutrition volunteer–dietician pair to 0.78 for the volunteer–volunteer pair. The overall ICC calculated from a 2-factor ANOVA table was 0.64, which suggests a good agreement (Fleiss, 1985; Table 3).

#### Intervention’s Feasibility and Participant Satisfaction

Participating clients gave very positive feedback on the intervention. All were satisfied with their relationships with the nutrition volunteers. Participating clients felt that nutrition volunteers were knowledgeable about nutrition (83%); 86 per cent indicated that they had provided useful information; 86 per cent were very satisfied with the length of the contact; and 90 per cent appreciated the efforts of the nutrition volunteers to arrange services for them. With one exception, all felt that the intervention was a worthwhile service.

The nutrition volunteers had a positive perception of the intervention: 85 per cent indicated that participating clients had appreciated their visits; 89 per cent did not have difficulty using or explaining the ENS<sup>©</sup> or the intervention plans; and contacting case managers to recommend additional services for participating clients was not a problem (86%). However, 73 per cent said that they would not have felt comfortable offering this intervention without a dietician’s assistance, particularly in reviewing the intervention plans.

**Table 3: Inter-rater reliability (correlations,  $t$  test, ICC)**

	Pearson Correlation		t test		Intraclass Correlation		
	$r^a$	p value	Difference <sup>b</sup>	95% CI	p value	r	95% CI
Older Adult Volunteer–Dietician	0.350	0.201	0.00	-0.94 to 0.94	0.990	0.356	-0.189 to 0.717
Older Adult Volunteer–Older Adult Volunteer	0.811	0.000	-0.43	-1.27 to 0.41	0.290	0.779	0.447 to 0.924
Total	0.677	0.000	-0.21	-0.80 to 0.39	0.483	0.641	0.382 to 0.820

<sup>a</sup> A high Pearson Correlation Coefficient demonstrates a good correlation between raters; an ICC greater than 0.75 reflects excellent agreement (i.e., 75% of the variation is attributable to differences between participants and not between raters); an ICC between 0.4 and 0.75 is a good agreement; and an ICC under 0.4 is a low agreement (Fleiss, 1985).

<sup>b</sup> The differences in the scores were not significantly different when an older adult nutrition volunteer was paired with another older adult nutrition volunteer or with a dietician ( $t = 0.73$ ,  $p = 0.47$ ).

All indicated that their training had been appropriate and that the materials on developing intervention plans and delivering nutrition education were sufficient. Most of them (75%) found the ENS<sup>©</sup>, the intervention plan, and the nutrition education intervention easy to use.

The majority of case managers felt that their regular clientele could benefit from this nutrition intervention (71%), also stating that the older adult nutrition volunteers were well suited to carry out nutrition screening (73%) and nutrition education (91%). However, only a third of case managers believed nutrition volunteers should develop intervention plans. Overall, 83 per cent of the case managers were satisfied with how the intervention was implemented; 72 per cent felt that the intervention could be integrated into their ongoing practice. All agreed that it was beneficial to have nutrition screening and an educational intervention.

## Discussion

Under-nutrition and weight loss, especially in frail older individuals, have been associated with functional decline (Stuck et al., 1999), hip fractures (Langlois et al., 1998), institutionalization (Jensen et al., 2001; Payette et al., 2000), and morbidity and mortality (Cornoni-Huntley et al., 1991; Liu et al., 2002; Payette, Boutier, & Gray-Donald, 1999; Sullivan & Walls, 1998). In the community setting, nutrition support interventions have been implemented to help older people increase the quantity and quality of the food they eat. These interventions aim to preserve functional status and quality of life for as long as possible and to prevent premature institutionalization or death. However, there is a high prevalence of inadequate dietary intake and therefore an increased risk of nutritional deficiencies among the home-bound older adult population (Millen et al., 2001; Payette et al., 1995; Sharkey, 2002, 2003). Nutritional screening is conducted in this population to detect those at high nutritional risk and to implement appropriate nutrition interventions before true under-nutrition is established.

In this study, we were concerned with finding an economical and feasible way of increasing our nutritional screening for high-risk community-dwelling older adults. We decided to train volunteers from a Montreal seniors' organization to perform nutritional screening with their peer group. In particular, we decided to target an obviously vulnerable group: home-bound community-dwelling older adults already receiving home care services. The nutrition volunteers would work under the supervision of a

dietician and in collaboration with case managers from the agency providing home care services. Our first objective was to test the reliability of the ENS<sup>©</sup>, a nutrition screening tool, when administered by these nutrition volunteers. But beyond that, we also wanted to test the overall feasibility of using nutrition volunteers for nutritional education and intervention based on the results of the screening.

Our findings suggested that older adult volunteers, when trained and supervised by a dietician, can reliably administer a nutrition screening tool to home-bound older adults (ICC = 0.78 for the volunteer–volunteer pair, ICC = 0.36 for the volunteer–dietician pair). We found that the ENS<sup>©</sup> is a very useful tool, and its use should be encouraged by the various people involved with older adults, including volunteers. However, the reliability was considerably lower between the volunteers and the dietician than among volunteers alone. To correct this problem, we will present several recommendations to enhance the training and thereby bring the volunteers' administration of the ENS<sup>©</sup> more into line with the results of the dietician.

The pilot study was a richly rewarding experience for the nutrition volunteers, and participating clients appreciated both the screening and education portions of the intervention. In general, the nutrition volunteers were comfortable delivering a nutrition education intervention in people's homes and performing follow-up work, either in the home or by telephone. However, they needed professional support to develop a nutrition intervention plan. In the future, we recommend that nutrition volunteers not be involved in this particular task, even with improved training. The nutrition volunteers clearly felt more comfortable preparing intervention plans *with* the dietician. In the end, both the case managers and the study's dietician agreed that this is a task requiring professional skills.

In general, we found that the ENS<sup>©</sup> is a reliable screening tool when administered by nutrition volunteers, and we believe that this reliability can be further enhanced by improving the volunteers' training program. Furthermore, it appears that it may be quite feasible to use older adult nutrition volunteers to provide nutritional education and intervention to at-risk older adults, as long as they do not have to develop the intervention plans and they are well-supported by a health and social services agency already involved in providing services to this population. Our findings were not unequivocally positive, however, and suggest some areas for modification and further investigation.

### *Inter-Rater Reliability and Implications for Training*

Clearly, the relatively low level of agreement in ratings between volunteers and the dietician is an issue of concern. In our study, nutrition volunteers often gave higher nutritional risk scores than did the dietician, which resulted in their detecting false positive subjects (27%). We considered some possible reasons for this.

Although the ENS<sup>®</sup> items were converted from statements to questions, we do not think this was responsible for the sub-optimal level of agreement observed between dietician and nutrition volunteer in this study. Our data do not permit us to know this, and we believe that any effect this minimal change may have had was marginal. Rather, we believe that the lower inter-rater agreement between nutrition volunteers and the dietician was primarily because dieticians are very familiar with this type of evaluation and they have received professional education in this area. This is supported by previous reliability studies, which showed higher correlations when ENS<sup>®</sup> was administered by a variety of field clinicians ( $n=17$ : nurses, social workers, occupational therapists, and so on; ICC = 0.84; Payette, 2005).

From the client's perspective, detecting false positives is less problematic in nutritional screening than detecting false negatives. However, false positives can generate costs to the health system if they result in case managers' implementing unnecessary services. To limit this, we recommend that case managers re-administer the ENS<sup>®</sup> before implementing any new services. False negatives, representing approximately 13 per cent of the clients in this study, are a different issue because potential harm may result from not having detected a client at risk. Our recommendations for improving the training, however, should also reduce the false negatives. Nonetheless, case managers should keep in mind that misclassification remains a possibility, even after improvements to the training.

A closer look at the data revealed that two items relating to appetite and stressful events showed a particularly low level of agreement in the dietician–nutrition volunteer pairs. This had an impact on both nutritional risk classification (low, moderate, high) and reliability. We think these two ENS<sup>®</sup> items are perhaps more subjective in nature. For example, even though we offered examples for the item on stressful events there may still be room for differences in interpretation. Furthermore, the client could also interpret the item on stressful events a little bit differently from one week to the next. The item on poor appetite is also subjective and may change from one week to the next. But it may also be that the

training on these items was not specific enough. To improve the reliability of these ENS<sup>®</sup> items, we would first try to enhance the training before changing the wording of the questions.

Considering our findings, we believe a special effort should be made to enhance the nutrition volunteers' training until the results of their ENS<sup>®</sup> administration more closely match a dietician's results, so that they achieve at least a 70-per-cent agreement rate before letting them do the screening on their own. This means that the answers of the dietician and the nutrition volunteer should agree for at least 7 of the 10 items of the ENS<sup>®</sup>. Future studies should explore the feasibility of this recommendation and identify the best ways to improve the training program. Below are some of our specific suggestions for doing so.

### *Specific Recommendations to Improve Volunteer–Dietician Inter-Rater Reliability*

During training, each ENS<sup>®</sup> item should be covered in more detail, especially those relating to appetite and stressful events. We should spend more time defining these items in the training program and give more examples of what we mean by these terms. We should also provide better guidelines on how to ask these questions and what to tell clients if they need further clarification. Near the end of the first training session, we would ask the dietician to administer the ENS<sup>®</sup> to real clients in front of the entire group.

After the first training session, if needed, nutrition volunteers could do additional practice with role-playing "clients" to ensure they become more uniform in their administration of the ENS<sup>®</sup>. If further training is still needed at that point, the trainer could accompany the nutrition volunteers to provide individual feedback, until the 70 per cent agreement threshold is reached.

### *The Feasibility of Using Nutrition Volunteers*

Nutrition volunteers should have certain characteristics: a genuine interest in nutrition, skill in communicating with older adults, and feeling comfortable going into unfamiliar territory.

As stated earlier, we do not recommend that nutrition volunteers be involved in the development of intervention plans, thus this material can be removed from the training program because it is no longer needed. The training time freed up could be reallocated to the use of the ENS<sup>®</sup>, to address the low reliability found for the nutrition volunteer–dietician pair, as in some of the above suggestions.



Our overall recommendation is for older adult nutrition volunteers who have been properly trained in using the ENS<sup>®</sup> to be incorporated into existing outreach efforts to screen and educate older adults about their nutritional risks. Although home care workers do try to detect older adults at nutritional risk in their caseloads, help from volunteers could increase such detection efforts, which are often not maximized due to time constraints. Moreover, if such an initiative should prove beneficial, nutrition volunteers could extend their screening to older adults not currently using home care services. In addition, although nutrition volunteers would no longer be responsible for the development of the intervention plan, they could still be involved in making follow-up calls or visits, depending on the setting and on an optional basis.

Securing the viability of this type of intervention requires appropriate administrative support. A staff person, perhaps from a community organization, is needed to recruit, train, and supervise nutrition volunteers. A dietician should conduct the nutritional education component of the training, thereby ensuring that the information imparted is accurate and appropriate as well as to clarify misconceptions and answer the volunteers' nutrition questions. Training should continue and the nutrition volunteers should not go out by themselves until they achieve an acceptable level of agreement (70%) with the dietician in completing the ENS<sup>®</sup>. This would decrease the proportion of false positives and false negatives. Nevertheless, in some settings, using nutrition volunteers to assist in screening provides screening to older adults who would otherwise not have had access to it at all. In such circumstances, it is better to screen, even knowing that the screening is not perfect.

It is also important that the nutrition intervention be implemented in collaboration with a home care services provider in the health and social services network. Such an alliance would serve two purposes: first, it would facilitate the dietician's involvement, and second, it would ensure that participating clients at moderate or high risk would have ready access to services. As nutrition volunteers might overestimate the risk for some clients, we recommend that the health professional re-administer the ENS<sup>®</sup> before implementing any new services. This would help limit the costs associated with implementing new, but unneeded services. It is also possible, however, that some clients at high risk may remain undetected by the volunteer. Even though, in this study, failure to detect a client at high risk occurred less frequently, it should still be kept in mind by health professionals, so that the information collected by nutrition volunteers is not accepted at face value.

Lastly, since little time is required to administer the ENS<sup>®</sup>, we also recommend carrying out both the screening and 30-minute educational activity during the same visit.

## Conclusions

In general, this pilot study was a richly rewarding experience for the nutrition volunteers. Participating clients appreciated both the screening and education portions of the intervention and could benefit from received much-needed nutritional services. Our overall recommendation is that older adult nutrition volunteers, who have been properly trained in the use of the ENS<sup>®</sup> and who work under the supervision of a professional dietician, be incorporated into existing outreach efforts to screen and educate older adults about their nutritional risks. While case managers can administer the ENS<sup>®</sup> in their own practice, involving volunteers in a nutritional intervention is an affordable, effective, and reliable alternative strategy for improving the health of home-bound older adults.

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