

Nutrition and Health Risks in the Elderly: The Nutrition Screening Initiative

ABSTRACT

Objectives. The Nutrition Screening Initiative is a national collaborative effort committed to the identification and treatment of nutritional problems in older persons.

Methods. A 14-item checklist of characteristics associated with nutritional status was administered to a random sample of Medicare beneficiaries, aged 70 years and older, in New England. Regression analysis was used to derive item weights that would predict poor nutrient intakes and low perceived health status. Sensitivity and specificity values were reviewed to define low, moderate, and high nutritional risk scores.

Results. A revised checklist containing 10 yes/no items was adopted. Scores of 6 or more points defined persons at high nutritional risk. Twenty-four percent of the Medicare population was estimated to be at high nutritional risk according to the checklist. Among those in the high-risk group, 56% perceived their health to be "fair" or "poor" and 38% had dietary intakes below 75% of the recommended dietary allowances for three or more nutrients.

Conclusions. The Nutrition Screening Initiative Checklist is a brief, easily scored instrument that can accurately identify noninstitutionalized older persons at risk for low nutrient intake and health problems. (*Am J Public Health*. 1993;83:972-978)

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Introduction

Nutritional well-being is an integral component of the health, independence, and quality of life of older individuals.¹⁻³ Although the majority of persons aged 70 years and older are reported to be in good to excellent health^{4,5} it is estimated that 85% of noninstitutionalized older persons have one or more chronic conditions that could improve with proper nutrition^{1,2} and that up to half have clinically identifiable problems that require nutrition intervention.^{1,5,6}

The detection of nutritional risk among the elderly and referral as needed to appropriate nutrition services and resources are key concerns of the Nutrition Screening Initiative.^{1,7} The Initiative, a national effort supported by more than 25 professional organizations, is committed to the identification of nutritional problems in older persons and to improved delivery of nutrition services to those with the greatest nutrition-related health risks.

Through a consensus-building process and ongoing research, the Nutrition Screening Initiative has developed strategies for increasing consumer awareness of nutrition problems and detecting nutritional risk among older people in different settings.⁷⁻⁹ These strategies include the development of a Checklist to increase consumer nutrition awareness. The Checklist describes characteristics associated with poor nutritional status and guides consumers to professionals with whom to discuss nutritional concerns.¹⁰ Early professional diagnosis and treatment of nutrition-related problems in the elderly should improve the management of chronic conditions in older people and enhance their well-being and quality of life.¹¹

The purpose of the research presented in this report was to recommend items for the Initiative's consumer awareness Checklist and to calibrate the instrument. Specifically, we examined the relative importance of Checklist items in predicting nutrient intake and health outcomes, made recommendations for item weights in the Checklist, and estimated the distribution of Checklist scores in a noninstitutionalized older population.

Methods

Nutrition Screening Initiative Checklist

The Checklist was designed as a brief risk-appraisal questionnaire that could be self-administered and scored by older persons, their family members, or caregivers. The 14 items considered for inclusion (see the Appendix) were selected on the basis of associations found with the nutritional well-being of older people in previous research.^{1,6,12-14}

Interview Protocol

Subjects for this study were identified from 2052 participants in the 1990 New

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Editor's Note. See related editorial by Rush (p 944) in this issue.

England Elders Dental Study who completed a telephone survey, a home visit, or both.¹⁵ The dental study provided an examination of oral health status in a stratified random sample of Medicare beneficiaries aged 70 years or older in the six New England states. During in-home dental examination visits, trained interviewers measured subjects' height and weight and conducted 24-hour dietary recalls with the subjects or their designated proxies. The subjects were asked to recall all foods consumed the previous day (midnight to midnight); they were guided by standardized interviewer probes. After the foods had been listed, the interviewers elicited complete food item descriptions, including modifications during cooking. Food portions were described with the help of a two-dimensional visual aid previously validated by Posner et al.¹⁶ in an older population.

A random sample of 1071 Dental Study participants was recontacted by telephone in September 1991 to determine their eligibility for the present study. Ninety-two persons who were institutionalized, had died, or had difficulty speaking English were ineligible for the interview. Of the 979 eligible subjects, 749 (a 77% response rate) were administered a 5- to 7-minute interview in which information was collected about each of the Checklist items, recent health problems, current weight, and any changes in health or dietary practices that had occurred in the previous year. The subjects' height was taken from the in-home measurements conducted in 1990. Current weight was self-reported in the 1991 telephone interview. Fifty-six of the interviews were completed by a proxy respondent.

Nutrient Intake Estimation and Evaluation

An experienced coder entered all 24-hour dietary recalls, using the interactive, computerized Nutrient Data Management System (Nutrition Consulting Enterprises, Framingham, Mass). The US Department of Agriculture standards for unknown food portions were used where appropriate.¹⁷ The nutrient composition of foods was calculated with the Michigan State University nutrient database.¹⁸ A 10% random sample of recalls was coded in duplicate to evaluate intracoder reliability; the coder was blinded to the duplicate entry. Pearson correlations (r_s) between the duplicate recalls ranged from .90 to .98 for 18 major dietary constituents.

As a measure of the overall nutritional adequacy of the diet, we considered

the estimated intake of five marker nutrients (protein, vitamin A, vitamin C, thiamine, and calcium) that are among those most likely to be inadequate in the diets of older persons.^{1,6} We compared intakes with the recommended dietary allowances (RDAs) for men and women aged 51 years or older¹⁹ and used an intake of less than 75% of the RDA as a criterion of dietary inadequacy.²⁰

Analysis Methods

The primary objective of the study was to derive a set of weights for the individual Checklist items that could be used to predict adequacy of nutrient intake and overall perceived health. Two criterion outcome measures were used in a regression analysis to estimate Checklist item weights. The first criterion was a count of the number of nutrients for which a respondent's 24-hour intake was less than 75% of the RDA standard. Nutrient intake information was available for 578 members of the overall Nutrition Screening Initiative sample who had completed the Dental Study 24-hour dietary recall questionnaire during home visits in 1990. Of these, 119 respondents who reported having changed their diets for health reasons during the previous 12 months were excluded. The nutrient intake regression analyses were based on 449 sample members for whom dietary data were available and who had reported that they had not changed their diets for health reasons during the previous 12 months ($n = 449$). The regression models included adjustments for sex and whether the recall period was a weekend day or a weekday.²¹ Ten individuals were missing data needed for the regression analyses.

The second criterion was the respondents' perceived health, which they were asked to rate as excellent (1), very good (2), good (3), fair (4), or poor (5). A sizable body of literature has shown that self-reported health status is associated with subsequent morbidity and mortality independently of clinical assessments of physical health.²²⁻²⁶ In the present study, perceived health status was presumed to be influenced in part by nutritional problems. Adjustments were made for recent health problems (hospitalizations and bed days in the past year), tobacco use, the physical functioning and mental health scales developed by the Medical Outcomes Study,²⁷ and nine chronic health conditions (arthritis, hypertension, cancer, heart attack, diabetes, lung disease,

stroke, osteoporosis, congestive heart failure). These analyses included 500 subjects.

Because both criterion measures were normally distributed, ordinary least squares was used for estimation purposes. Coefficients for individual Checklist items were converted to effect sizes (unstandardized coefficient divided by the criterion measure standard deviation)²⁸ to facilitate comparisons between the models.

The regression analyses were discussed by the Nutrition Screening Initiative's technical review committee, which was composed of experienced clinicians in geriatric medicine and nutrition. Final item weights and Checklist cut-points were determined by consensus within the committee. Using the final list of items and weights and various score cut-points, we computed sensitivity, specificity, and positive predictive values to assess the Checklist's ability to identify respondents at increased nutritional risk according to the two study criteria.

Frequency distributions were weighted to represent the population of Medicare beneficiaries residing in New England. The sampling weights incorporated adjustments for respondent selection probabilities, telephone survey response rates, and poststratification for age group and sex distribution.

Results

Sample Demographic and Health Characteristics

Table 1 summarizes the demographic and health characteristics of the 749 sample members. The sample was predominantly female and White. Just less than half were married; 43% lived alone. Those aged 80 and over represented 35% of the sample. Thirty percent of the sample perceived their health to be fair or poor. Twenty percent reported having been hospitalized overnight in the previous 12 months. Arthritis and hypertension were the most frequently reported chronic conditions. More than half of the sample reported two or more chronic conditions. One third of those studied had a body mass index that was indicative of underweight (less than 24 kg/m²) and 36% had an index indicative of obesity (27 kg/m² or larger).

Dietary Profiles

Table 2 summarizes the dietary intake of the 459 respondents from the Dental Study who completed a 24-hour dietary

TABLE 1—Demographic and Health Characteristics of Nutrition Screening Initiative Sample (n = 749)

	%
Age	
70–79 y	65
≥80 y	35
Sex: female	64
Race: White	96
Marital status	
Currently married	48
Widowed/divorced/separated/ never married	52
Living situation: live alone	43
Education: < high school diploma	40
Income: < \$10 000/y (1989/90)	39
Perceived health	
Excellent	11
Very good or good	59
Fair or poor	30
Hospitalized in previous 12 mo	20
Reported chronic conditions	
Arthritis	53
Hypertension	52
Cancer	15
Heart attack	13
Diabetes	12
Lung disease	9
Stroke	8
Osteoporosis	8
Congestive heart failure	4
2 or more chronic conditions	52
Body mass index	
< 24 kg/m ²	33
> 27 kg/m ²	36

Note. Percentages are weighted for selection probabilities, response rates, and age and sex composition to reflect New England Medicare population.

recall and had reported that their diets were unchanged during the previous 12 months. Calorie levels for both men and women appeared adequate. Men consumed higher absolute levels of all nutrients. Mean dietary fat intake levels were relatively high in both men and women. Mean intakes of protein, vitamin A, ascorbic acid, and thiamine met RDA standards for persons 51 years and older, but mean calcium intakes fell below the RDA standards.

Table 3 displays the percentages of the sample with estimated dietary intakes of less than 75% of the RDA for the five marker nutrients. A majority (58%) of the sample had estimated intakes below 75% of the RDA for calcium and more than 40% had estimated vitamin A intakes below 75% of the RDA. Table 3 also shows the distribution of the sample according to

TABLE 2—Mean Dietary Intakes of Nutrition Screening Initiative Sample

	Women (n = 257)	Men (n = 202)
Kilocalories	1484	1887
Carbohydrates, g	165	204
Dietary cholesterol, mg	247	330
Total fat, g	62	78
% calories from fat	35.7	37.0
Saturated fat, g	20	27
% calories from saturated fat	11.8	12.5
Polyunsaturated fat, g	10	12
% calories from polyunsaturated fat	5.8	5.7
Hegsted score ^a	32.7	39.8
Protein, g	67	83
Vitamin A, IU	6187	6270
Vitamin C, mg	122	118
Thiamine, mg	1.1	1.4
Calcium, mg	594	677

^aHegsted score²⁹ = 216S - 1.65P + 0.0677C, where S = % calories from saturated fat, P = % calories from polyunsaturated fat, and C = cholesterol intake in milligrams.

number of nutrients in which the diet was inadequate. Twenty-seven percent of the sample were estimated to consume diets that exceeded the criterion for all five nutrients. At the other extreme, 3.5% had estimated dietary intakes that fell below 75% of the RDA for all five nutrients.

Checklist Responses

Figure 1 shows the sex-specific distribution of responses to each item. Statistically significant sex differences were seen in the proportions of respondents who reported being 80 years of age or older, losing 10 or more pounds in the previous 6 months, eating alone, and having three or more drinks per day. More than 30% of both men and women reported changing the food they ate because of illness; eating few fruits, vegetables, or milk products; and taking three or more drugs each day.

Regression Analyses

Table 4 shows effect sizes for each of the 14 items in regression models for dietary inadequacy and perceived health. The results show that lack of monetary resources, eating fewer than two meals per day, and eating few fruits and vegetables were the strongest predictors of inadequate nutrient intake. The best predictors of perceived health (when recent hospitalizations, physical functioning, chronic disease status, and mental health

TABLE 3—Percentages of Nutrition Screening Initiative Sample (n = 449) with Dietary Intakes of Less than 75% of Recommended Dietary Allowance

Low in	
Protein	19.2
Vitamin A	40.1
Vitamin C	19.2
Thiamine	9.2
Calcium	58.2
Low in	
0 nutrients	27.5
1 nutrients	30.1
2 nutrients	22.4
3 nutrients	12.9
4 nutrients	3.7
5 nutrients	3.5

were controlled for) were taking three or more drugs per day and having changed one's diet because of illness.

Figure 2 shows the revised Checklist constructed by the Nutrition Screening Initiative technical advisory panel after considering these analyses, panel members' own clinical experiences, and the existing literature on nutritional risk in the aged.^{1–14} The items asking about age, vitamin use, and swallowing-problems were dropped from the revised Checklist because of the inability of these items to predict either dietary intake or perceived health outcomes. Recent unintentional weight loss and weight gain were combined into a single item that reflected recent weight change. The scores assigned to the items reflect each item's relative importance as an independent indicator of nutritional risk. Lacking enough money to buy food received the highest weight (4) of all items in the Checklist. Eating alone and taking three or more different medications a day received the lowest weight (1).

Checklist Evaluation

Figure 3 presents the cumulative percentage distribution of scores on the revised Checklist (Figure 2) for the total sample (n = 749).

Table 5 summarizes the sensitivity, specificity, and positive predictive value for three cutpoints (4 points, 6 points, and 8 points) when used to identify older persons with estimated intakes below 75% of the RDA for three or more nutrients or with fair or poor perceived health. Specificity increased and sensitivity decreased with higher cut-point values, as would be expected. On the basis of this analysis, the technical review committee selected a score of 6 points or more as the criterion

for identifying older persons at high nutritional risk. On the basis of the distribution of weighted scores, we estimate that 24% of all Medicare beneficiaries fall into the high-risk group, 38% are at moderate risk (3, 4, or 5 points) and 37% are at low risk (0, 1, or 2 points).

The characteristics of respondents in these three categories appear in Table 6. The percentage of persons whose intake of three or more nutrients was below 75% of the RDA and the percentage with fair or poor perceived health were almost twice as large in the high-risk group as in the moderate-risk group and three to four times higher in the high-risk group than in the low-risk group. Members of the high-risk group tended to have lower levels of income and educational attainment and were more likely to be older and to have been hospitalized in the past year.

Discussion

The Nutrition Screening Initiative Checklist is designed to identify individuals whose diets are relatively low in nutrient intake in comparison with RDA standards or who perceive themselves to be in fair or poor health. Our experience indicates that the Checklist is easily used in telephone-administered interviews and may therefore be particularly appropriate for population-based research and related applications.

A score of 6 or higher on the Checklist developed and evaluated in this study identifies between 36% and 46% of older persons who may be at increased nutritional risk owing to inadequate intakes of essential nutrients or to fair or poor perceived health. The cutoff level of 6 points was selected to balance sensitivity and specificity so that not too many persons (fewer than 15%) with higher estimated intakes of nutrients or better perceived health were misclassified as being at high nutritional risk. This cutoff point minimizes unwarranted concern on the part of mislabeled elders as well as unnecessary treatment costs that may accrue as a result of such misclassification. However, given that those who are classified as high risk are encouraged to report their Checklist scores only at their next regularly scheduled medical visit, a lower cutoff point, such as 4 points, would also be relatively cost-efficient, increasing the sensitivity to over 60% while maintaining modest levels (37.3%, 35.5%) of misclassification of low-risk individuals into the high-risk category.

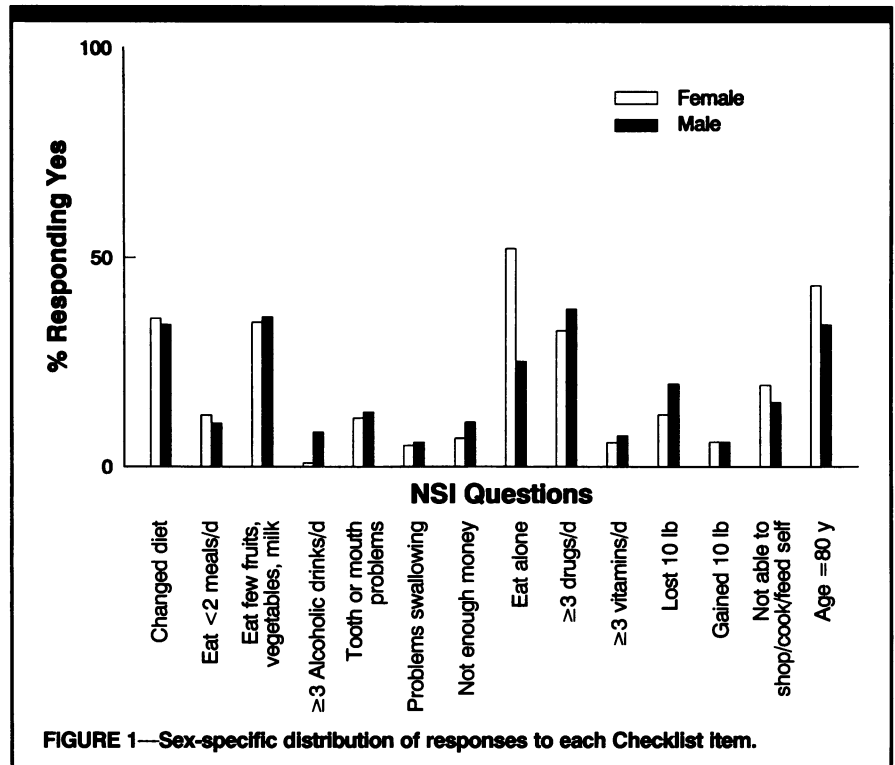


FIGURE 1—Sex-specific distribution of responses to each Checklist Item.

TABLE 4—Checklist Item Effect Sizes for Two Outcome Criteria

Item	Dietary Inadequacy (n = 449)	Perceived Health (n = 500)
1. Changed diet	-.02	.31*
2. Eat fewer than two meals per day	.52*	.02
3. Eat few fruits and vegetables	.40*	.06
4. ≥3 alcoholic drinks per day	.07	.16
5. Tooth/mouth problems	.29	.06
6. Trouble swallowing	-.06	.18
7. Not enough money	.72*	.15
8. Eat alone	.19	-.01
9. ≥3 drugs per day	-.17	.35*
10. ≥3 vitamins per day	-.33	-.11
11. Lost ≥10 lb	-.07	.09
12. Gained ≥10 lb	.11	.26
13. Not able to cook or shop	.16	.15
14. Age ≥80 y	.08	.09

*P < .01.

Several possible outcome variable criteria were considered initially, including nutrient intakes in relation to the RDAs, perceived health, dietary atherogenicity,²⁹ and body mass index (because of its proposed relation to estimated mortality).³⁰ Inadequate nutrient intake is a common nutritional problem among older people,^{1,3,6,13,14} and we chose to use the RDAs because they are carefully determined standards for the US general population and they have been widely used in nutrition research.^{19,20} We also chose to use perceived health as an outcome be-

cause of the well-established relationship between self-assessments of health and subsequent morbidity and mortality.²²⁻²⁶

Chronic consumption of high levels of fat and cholesterol is an important concern for older persons. Nonetheless, dietary atherogenicity was not used as a major outcome criterion because the Checklist was designed to measure established predictors of inadequate dietary intakes and nutrient deprivation rather than overconsumption of dietary lipids or other food components. We also chose not to use body mass index as a criterion, be-

The Warning Signs of poor nutritional health are often overlooked. Use this checklist to find out if you or someone you know is at nutritional risk.

DETERMINE YOUR NUTRITIONAL HEALTH

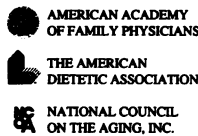
Read the statements below. Circle the number in the yes column for those that apply to you or someone you know. For each yes answer, score the number in the box. Total your nutritional score.

	YES
I have an illness or condition that made me change the kind and/or amount of food I eat.	2
I eat fewer than 2 meals per day.	3
I eat few fruits or vegetables, or milk products.	2
I have 3 or more drinks of beer, liquor or wine almost every day.	2
I have tooth or mouth problems that make it hard for me to eat.	2
I don't always have enough money to buy the food I need.	4
I eat alone most of the time.	1
I take 3 or more different prescribed or over-the-counter drugs a day.	1
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	2
I am not always physically able to shop, cook and/or feed myself.	2
TOTAL	

Total Your Nutritional Score. If It's --

- 0-2 Good!** Recheck your nutritional score in 6 months.
- 3-5 You are at moderate nutritional risk.** See what can be done to improve your eating habits and lifestyle. Your office on aging, senior nutrition program, senior citizens center or health department can help. Recheck your nutritional score in 3 months.
- 6 or more You are at high nutritional risk.** Bring this checklist the next time you see your doctor, dietitian or other qualified health or social service professional. Talk with them about any problems you may have. Ask for help to improve your nutritional health.

These materials developed and distributed by the Nutrition Screening Initiative, a project of:



Remember that warning signs suggest risk, but do not represent diagnosis of any condition. Turn the page to learn more about the Warning Signs of poor nutritional health.

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FIGURE 2—Revised Nutrition Screening Initiative Checklist.

cause we found considerable controversy about its use as a predictor of morbidity and mortality in older persons.⁸

Because the nutritional outcome examined here was a measure of nutritional inadequacy, it should be noted that the Checklist may underestimate the extent of nutritional problems related to dietary excess or to the consequences of dietary excess, such as obesity.

The Checklist analysis was conducted with a representative sample of noninstitutionalized persons aged 70 years and older in New England. Therefore, the derived estimates of nutrition and health status and demographic characteristics may not be generalizable to institutionalized elders. In addition, because 96% of the sample was White, we cannot be cer-

tain that the scoring system applies equally well to non-Whites.

The Checklist has not been independently validated. Our estimates of the sensitivity and specificity of scores are likely to be somewhat overstated because they are based on the same sample used to develop the scoring system. A priority for future research should therefore be to conduct validation studies of the Checklist, especially among minority populations and groups of individuals for whom detailed nutritional status assessments can be performed.

Data from this sample indicate that nearly three fourths (70.4%) of noninstitutionalized persons aged 70 years and older in New England perceive themselves to be in good to excellent health but

that over half (54.7%) have two or more chronic conditions, many of which can be prevented or improved with proper nutrition. A spectrum of nutrition problems appear to exist in this population. Some 36% have a body mass index of 27 or higher, indicative of obesity, and 33% have a body mass index lower than 24, which suggests that they are underweight. The 24-hour dietary recalls indicate that a substantial proportion of older people consume inadequate levels of one or more nutrients and levels of dietary lipids, particularly total and saturated fat, that are above the levels recommended for the population.^{5,31-33} The apparent nutritional problems of these older persons are compounded in many cases by sociodemographic factors, such as low income, low educational levels, and living alone, all of which may increase nutritional risk and complicate intervention strategies.

These findings are broadly similar to other findings in older populations. The National Health and Nutrition Examination Survey (1976 through 1980) found that the mean nutrient intakes of both men and women from 65 through 74 years of age were generally above RDA standards, except for calcium. In addition, 35% to 54% of women and 24% to 38% of men aged 70 through 74 years were overweight (85th percentile) and 9% to 17% of women and 5% to 10% of men were severely overweight (95th percentile); the ranges reflect the observed racial and ethnic differences.³⁴ National estimates also suggest that significant proportions of the older population consume excessive levels of certain dietary components, particularly dietary lipids, which may increase risk of or complications associated with chronic diseases including heart disease, hypertension, diabetes, and osteoporosis.³ Indeed, from 30% to 46% of men and from 24% to 40% of women aged 55 through 74 years are hypertensive.^{4,35} The prevalence of hypercholesterolemia is 14% to 15% in men and 33% to 37% in women aged 70 through 74 years,¹ and diabetes afflicts from 7% to 9% of those aged 55 years and older.⁴ The poor health and nutritional profiles of many older persons led the US surgeon general⁵ to recommend that intervention strategies be sought to improve the nutritional status of older persons, particularly with respect to chronic disease risk.

In addition to problems of nutritional excess, a smaller but significant proportion of the older population (5% to 15%) may consume low dietary levels of calcium, iron, certain B vitamins, ascorbic

mote the consideration of nutritional problems by health professionals. When discussed with a health professional, the Checklist provides a foundation for further nutritional problem assessment and intervention planning, as appropriate, for identified problems.

The Checklist is not a clinical diagnostic tool, nor is it meant to replace more comprehensive appraisals of nutritional status. Nonetheless, it predicts overall perceived health status and identifies persons whose estimated nutrient intakes fall below the RDAs. It is recommended that public health professionals consider using the Nutrition Screening Initiative Checklist in their practice settings. Increasing public awareness of nutrition-related problems in older persons and the importance of nutrition in sustaining health into older age has the potential for preventing malnutrition, improving the management of nutrition-related chronic diseases, and enhancing the quality of life of older persons. □

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The Checklist is available through the Nutrition Screening Initiative (2626 Pennsylvania Ave, NW, Suite 301, Washington, DC 20037; [202] 625-1662).

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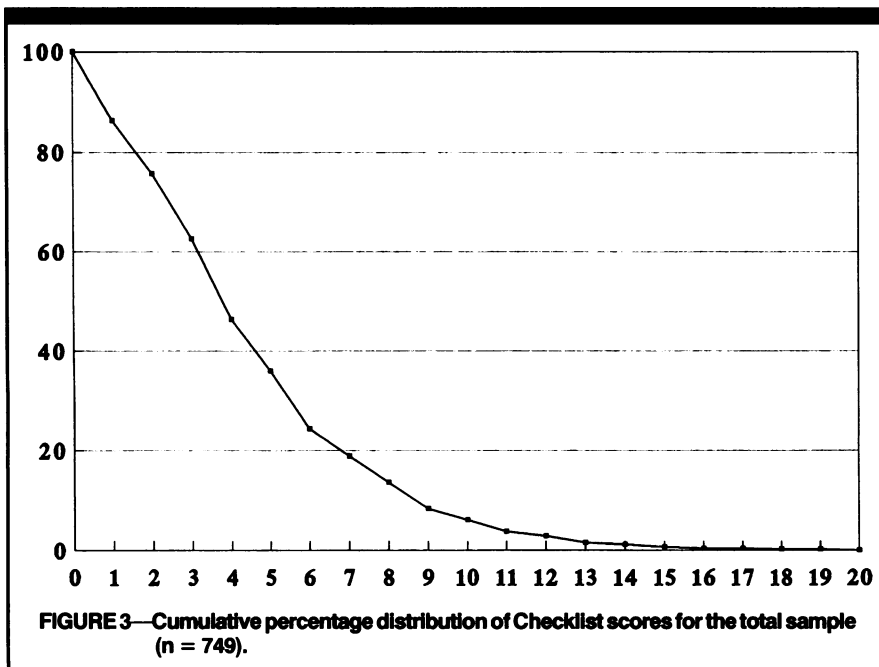


FIGURE 3—Cumulative percentage distribution of Checklist scores for the total sample (n = 749).

TABLE 5—Diagnostic Statistics for Selected Checklist Score Cut-Points

	Intake of ≥3 Nutrients below 75% of RDA			Perceived Health Fair or Poor		
	4 Points	6 Points	8 Points	4 Points	6 Points	8 Points
Sensitivity	60.9	36.2	23.2	72.2	45.8	25.5
Specificity	62.7	84.9	94.8	64.5	84.8	91.1
Positive predictive value	29.4	37.9	53.3	45.9	55.6	54.5

Note. RDA = recommended dietary allowance.

TABLE 6—Demographic and Health Characteristics (%), by Score on Nutrition Screening Initiative Checklist

	Low Risk (0-2 points)	Moderate Risk (3-5 points)	High Risk (≥6 points)
Perceived health fair or poor	12.4	29.5	55.8*
Less than 75% of RDA for three or more nutrients	12.6	19.7	38.1*
Hospitalized overnight in past year	10.7	19.1	36.6*
High school graduate	70.3	61.5	44.7*
Annual income > \$20 000	35.5	23.5	9.7*
BMI < 24 kg/m ²	37.9	28.8	29.9
BMI > 27 kg/m ²	30.0	38.5	43.0
Female	63.1	62.3	65.5
Age 80 years or older	28.9	38.4	37.4**

Note. RDA = recommended dietary allowance; BMI = body mass index. *P < .01; **P < .05.

acid, and vitamin D.^{6,36} Clinical evidence of nutritional deficiencies is more prevalent among those who are very old and frail, those who suffer from severe physical or emotional limitations, those who have multiple chronic conditions or take

many medications, and those who are institutionalized or homebound.^{1,6,36}

The Nutrition Screening Initiative Checklist is designed to enhance the older person's understanding of the determinants of nutritional well-being and to pro-

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APPENDIX—Questions Considered for the Nutrition Screening Initiative and Additional Questions Asked during Interview

Yes/no items considered for the checklist

1. Because of an illness, I have changed the kind or amount of food I eat.
2. I usually eat less than two meals per day.
3. I eat few fruits and vegetables or milk products.
4. I have three or more drinks of beer, liquor, or wine almost every day.
5. I have tooth or mouth problems that make it hard for me to eat.
6. I have swallowing problems that make it hard for me to eat.
7. Sometimes I don't have enough money to buy the food I need.
8. I eat alone most of the time.
9. I take three or more different prescribed or over-the-counter drugs a day.
10. I have three or more different vitamin or mineral pills a day.
11. Without trying to, I have lost 10 or more pounds in the past 6 months.
12. Without trying to, I have gained 10 or more pounds in the past 6 months.
13. I am not always physically able to shop, cook, and/or feed myself.
14. I am 80 years old or older.

Additional interview questions

15. Would you say your health in general is:
Excellent, very good, good, fair, or poor?
16. Compared to 12 months ago, is your health:
Better now, worse now, or about the same?
17. Have you been in the hospital for at least one overnight stay in the past 12 months?
No Yes (Go to Q. 17.1.)
- 17.1 During the past 12 months, how many different times did you stay in a hospital overnight or longer?
18. Have you had an illness that kept you in bed at home during the past 12 months?
No Yes
19. During the past 12 months, have you changed what you eat because of any medical reason or health condition, including to lose weight or gain weight or to lower your cholesterol?
No Yes