Résumé

Auto-signalement de déficiences auditives et visuelles et satisfaction à la vie chez les aînés francophones

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La présente étude a pour but d'examiner la contribution des déficiences auditives et visuelles sur la satisfaction à la vie. L'analyse des données secondaires a porté sur un échantillon de 826 personnes âgées ayant participé à l'enquête *Vieillir dans la communauté : santé et autonomie.* Une analyse de régression multiple hiérarchique fut utilisée afin d'évaluer la contribution de quatre groupes de variables. Les variables démographiques incluent l'âge, le sexe, le niveau de scolarité et le revenu, tandis que les variables de santé comportent le nombre de maladies chroniques, les limites fonctionnelles et le rappel. Les quatre variables de style de vie sont le soutien social, les activités sociales et physiques ainsi que le contrôle de son sort. Le dernier groupe de variables comprend les déficiences auditives et visuelles. Le modèle final explique 36 % de la variance. Toutes les variables sont significatives, sauf le rappel et les activités physiques. Bien que les variables de santé expliquent une plus grande part de la variance, les déficiences auditives et visuelles contribuent significativement au modèle. Ces résultats indiquent l'importance des composantes visuelles et auditives dans la satisfaction à la vie.

Mots-clés : satisfaction à la vie, aînés, déficiences auditives et visuelles

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Self-Reported Sensory Impairment and Life Satisfaction in Older French-Speaking Adults

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The purpose of this study was to examine the contribution of sensory impairments to life satisfaction in the elderly. A secondary data analysis was conducted with 826 older French-speaking participants in a larger study. Hierarchical regression analysis was used to determine the role played by 4 sets of variables in life satisfaction. The demographic variables included age, sex, education, and income. The health variables included number of chronic illnesses, functional limitations, and story recall. There were 4 lifestyle variables: social support, social activity, physical activity, and perceived control. The sensory impairment variables included vision and hearing. The final model explained 36% of the variance. All variables except story recall and physical activity were found to be significant. Although health explained a larger percentage of the variance, the sensory impairment variables contributed significantly to the model. The findings indicate that vision and hearing are important components of life satisfaction.

Keywords: Life satisfaction, older adults, sensory impairments

The negative impact of vision loss on quality of life has been noted in many studies (Appollonio, Carabellese, Frattola, & Trabucchi, 1996; Lee, Spritzer, & Hays, 1997; Mulrow et al., 1990), as has hearing impairment (Dalton et al., 2003; Magilvy, 1985; Tesch-Römer, 1997). In spite of the negative impact of visual and hearing impairments on functioning, however, few studies have examined the effects of interactions among sensory systems on the well-being of older adults (Bazargan, Baker, & Bazargan, 2001). Although factors such as demographic, health, and lifestyle variables are often examined in the study of the subjective well-being of older adults, few studies have examined the relationship between sensory impairment and life satisfaction (Bazargan et al., 2001). Life satisfaction can be defined as a global cognitive appraisal of the affective quality of one's life as a whole (Diener, 2000). The judgement of satisfaction is usually based on one's own set of criteria and can be affected by situational factors (Diener & Suh, 1997). Even though the cumulative effects of both visual and hearing impairment exert a negative impact on the well-being of older adults, little attention has been given to dual sensory loss (Brennan, Horowitz, & Su, 2005). The present

study was intended to determine whether visual and hearing impairments and their interaction have an impact on life satisfaction.

Various studies indicate that 18% to 27% of older adults report visual impairment (Campbell, Crews, Moriarty, Zack, & Blackman, 1999; Kington, Rogowski, Lillard, & Lee, 1997). Visual impairment is often associated with increasing age but not with other demographic variables such as sex, education, or income (Branch, Horowitz, & Carr, 1989). Self-reported functional limitations are frequently associated with visual impairment (Branch et al.; Kington et al.; Lee et al., 1997; Salive et al., 1992). Vision loss in older adults often results in reduced independent mobility, travel, and leisure activities (Dargent-Molina, Hays, & Bréart, 1996; Long, Boyett, & Griffin-Shirley, 1996). When compared to older adults without vision loss, those with visual impairment are less socially active (Resnick, Fries, & Verbrugge, 1997) and report greater psychological distress (Bazargan & Hamm-Baugh, 1995; Hersen et al., 1995; Horowitz, 1995; Karlsson, 1998), more loss of control and self-esteem (Branch et al.), and diminished well-being (Brenner, Curbow, Javitt, Legro, & Sommer, 1993; Lee et al., 1997; Lee, Smith, & Kington, 1999).

In the case of hearing, 20% to 25% of older adults report having some impairment (Lee et al., 1999; Strawbridge, Wallhagen, Shema, & Kaplan, 2000). Hearing impairment is associated with increasing age; prevalence rates vary from 25% for those aged 70 to 74 to 50% for those over 85 (Bogardus, Yueh, & Shekelle, 2003). It is greater for men than for women (Strawbridge et al.). Cacciatore et al. (1999) found that the probability of having a hearing impairment increases with age but decreases with higher levels of education. Older adults with hearing impairment report psychological distress (Bazargan & Hamm-Baugh, 1995; Branch et al., 1989; Horowitz, 1995), loss of control and self-esteem (Branch et al.), and diminished well-being (Brenner et al., 1993; Lee et al., 1999). Dalton et al. (2003) found that hearing loss impacts on the quality of life of older adults. Findings of studies with older adults experiencing hearing loss have been inconsistent in relation to functional impairment and social involvement. Some studies have found hearing loss to be associated with low levels of social engagement, functional impairment, and reduced time spent on activities (Branch et al.; Kington et al., 1997; Lee et al., 1999; Mulrow et al., 1990; Resnick et al., 1997), while others have found the opposite or no difference (Norris & Cunningham, 1981; Rudberg, Furner, Dunn, & Cassel, 1993). Some of these discrepancies are due to the considerable variations that have been noted between objective and self-report measures (Nondahl et al., 1998). Finally, a link has been found between hearing impairment and cognition. Older adults with hearing loss perform less well than those without hearing loss on verbal tests of cognition but not on non-verbal tests (Thomas et al., 1983).

Approximately 9% of older adults report both visual and hearing impairments (Campbell et al., 1999). Although vision and hearing are associated with quality of life in older adults, the research findings vary. Carabellese et al. (1993) found that visual impairment impacts negatively on mood and on social relationships whereas hearing impairment impacts negatively on activities of daily living. Marsiske, Klumb, and Baltes (1997) found that visual and hearing impairment could account for most of the variance in everyday activities. Individuals with dual sensory impairment have increased risk of difficulty, compared to those with a single sensory impairment or with no sensory impairment, on some activities of daily living (Brennan et al., 2005). However, as noted by Kahneman, Diener, and Schwarz (1999), there remains a high degree of unexplained variance in the research literature even when personality and contextual variables are examined. Few studies have examined the combined effect of visual and hearing impairment on functional status and quality of life. The interaction effects of visual and hearing impairment on functional status and quality of life in older adults warrant further consideration (Bazargan et al., 2001).

The purpose of this study was to examine the role of visual and hearing impairment in self-reported life satisfaction while controlling for demographic, health, and lifestyle variables that also influence life satisfaction. It is possible that sensory deficits influence life satisfaction through their association with these variables. Controlling for relevant health, demographic, and lifestyle variables allows for the specification of possible direct independent effects of sensory impairment on life satisfaction, apart from their indirect effects through such variables. In addition, the study was intended to test the hypothesis that dual sensory impairment has a unique negative effect on life satisfaction beyond that caused by visual or hearing impairment alone.

Method

Participants

This article reports on a secondary analysis of a large data set from the Aging in the Community Study (Béland et al., 1998) examining the health and well-being of older French-speaking adults in eastern Canada. The sample comprised individuals aged 65 and over residing in Moncton, New Brunswick. Researchers contacted potential participants by telephone to describe the study and to schedule an interview in the homes of those who consented to participate. Twenty interviewers were trained to administer the questionnaire and code the data. The response rate was 67%, which is typical for Canadian surveys (Marshall, 1987). This sample of 1,499 people was considered representative of the French-

speaking population of the province of New Brunswick for age, sex, marital status, and education (Béland et al.).

The responses of a subset of participants for whom complete data were available on study measures and who had consented to take part in further research were selected for the study. The subset totalled 826, of whom 531 (64%) were women and 295 (36%) were men. Sixty-two percent were married. The participants ranged in age from 65 to 94, with a mean age of 74. Education level was as follows: primary or less, 56%; secondary, 24%; postsecondary, 17%.

Measures

The methodology for developing the survey questionnaire in the Aging in the Community Study is presented in Béland et al. (1998). Most of the measures for this questionnaire were adapted from the Established Populations for Epidemiologic Studies of the Elderly (EPESE) (Cornoni-Huntley, Blazer, Service, & Farmer, 1986). The present study selected measures on demographics, health, lifestyle, sensory impairment, and life satisfaction from the questionnaire.

Demographic variables. Demographic measures included age, sex, education, and income. Education was divided into six categories: *no schooling, some primary school, primary school completion, high school, technical school,* and *university.* Income was measured using total household monthly income, with 10 categories ranging from *no income* to *more than $5,000.*

Health, functional limitation, and cognitive function variables. The health measures included number of chronic illnesses, functional limitations, and narrative memory. The number of chronic illnesses was determined by self-reported chronic conditions from the list of 16 common conditions included in the EPESE (Cornoni-Huntley et al., 1986).

Two items from the *Rosow-Breslau Functional Health Index* (Rosow & Breslau, 1966) and five items from the *Physical Performance Scale* (Nagi, 1976) were used to assess functional limitations. The items on these scales evaluate a person's ability to perform physical activities such as bending, walking, climbing stairs, and lifting heavy objects. Participants were asked to rate the level of difficulty experienced in performing the activity, from *no difficulty* (1) to *cannot perform the task* (4). The alpha reliability coefficient for the functional limitations measure is .80.

In order to determine whether cognitive deficits are associated with life satisfaction, the *Short Story Test* (Scherr et al., 1988) was used to assess narrative memory. The number of recall errors by participants on the *Short Story Test* was used to assess narrative memory. Responses to this

measure yield alpha reliability coefficients of .64 for both men and women (Bourque, Pushkar, Bonneville, & Béland, 2005).

Lifestyle variables. Lifestyle measures included social support, social activities, physical activities, and sense of personal control. The social support measure was adapted from a 21-item scale developed by Seeman and Berkman (1988). It evaluates degree of satisfaction with relationships with friends, children, and family on a five-point scale, from *dissatisfied* to *very satisfied*. A higher score indicates greater satisfaction. Alpha reliability coefficients for this scale are .80 for men and .71 for women (Bourque et al., 2005).

Social activity was measured using the following item: *How many times a month do you do each of the following: (a) go shopping, (b) participate in recreational or cultural activities, (c) attend religious services?*

The self-reported frequencies for the three types of social activity were added up to obtain a composite measure of social activity. The self-reported physical activity measure assessed three dimensions pertaining to household or leisure activities such as gardening, walking, swimming, or dancing. The first evaluates frequency of physical activity: *For a person your age, would you say that you engage in: very little activity* (1), *enough physical activity* (2), or *much physical activity* (3). The second evaluates the importance of physical activity: *How important is physical activity in preventing illness in older adults? Unimportant* (1), *somewhat important* (2), *quite important* (3), *very important* (4). The final dimension evaluates level of actual physical exercise: *What is your level of physical activity? Light* (1), *moderate* (2), *strenuous* (3). The respective scores for the three questions were added up to obtain a composite of self-reported physical activity, with higher scores indicating higher levels of physical activity.

Sense of control was assessed using the seven-item *Sense of Mastery Index* developed by Pearlin and Schooler (1978). Possible responses range from *strongly agree* (1) to *strongly disagree* (5) on such items as *I have little control over things that happen to me* and *There is little I can do to change many of the important things in my life.* A higher score indicates a greater sense of personal control. The alpha reliability coefficient for this scale is .83.

Sensory impairment. The sensory impairment measures assessed the presence of visual and hearing problems using questions from the EPESE (Cornoni-Huntley et al., 1986). Self-reported visual impairment was established using three questions on such items as seeing at a distance, seeing at close range, and reading. Participants were asked to rate the level of difficulty from *no difficulty* (1) to *much difficulty* (3). Scores for the three questions were combined to obtain a composite score for visual impairment, with a higher score indicating a greater degree of impairment.

Self-reported hearing impairment was established using seven questions pertaining to hearing ability in various situations such as conver-

sations (with family members or friends) in specific areas (the home, restaurants, church) and during specific physical activities. Participants responded to each item with *no* or *yes.* Reuben, Walsh, Moore, Damesyn, and Greendale (1998) report that this screening questionnaire adequately detects hearing loss. Responses to the seven questions were combined to obtain a composite score for hearing impairment, with a higher score indicating a greater degree of impairment.

Life satisfaction was assessed using the following question from the EPESE (Cornoni-Huntley et al., 1986): *Are you satisfied with your life in general?* Options ranged from *not satisfied at all* (1) to *very satisfied* (5). The life satisfaction item has been found to be highly related to satisfaction with health, home, community, and income (Bourque et al., 2005). Single self-report items to measure global life satisfaction have frequently been used by researchers and have strong psychometric properties (Diener, 2000).

Procedure

The key investigators for the original study obtained ethical approval from the research ethics boards of the Université de Moncton and the Université de Montréal to proceed with analysis of data from the original survey. Only the data of those participants who in the original study gave their consent to participate in further research were used. The data sets are coded such that participants cannot be identified.

Results

Descriptive Statistics

Almost 97% of the participants wore glasses. The self-rated vision scores revealed that of the participants, including those who wore glasses, 78% reported no difficulty or only mild difficulty with their vision and 23% reported moderate or much difficulty primarily due to cataract and glaucoma. Only 44% reported having an eye examination within the preceding year.

Self-rating of hearing revealed that 70% of participants had no hearing difficulty and 30% had some or much difficulty. Only 11% of participants reported using a hearing aid. Of these, 48% indicated that they constantly used their hearing aid. The percentages of those who reported using their hearing aid frequently, sometimes, or never were 11, 21, and 16, respectively; nevertheless, 56% reported having excellent to good hearing with their hearing aid, 30% fair hearing, and just 14% poor hearing.

Data Analyses and Results

Data analysis called for comparison of those who reported mild or no sensory impairment and those who reported much difficulty with vision or hearing. Since it was expected that sensory impairment would be correlated with demographic, health, and lifestyle variables, a follow-up regression analysis was conducted. Subsequently, hierarchical regression analysis was used to examine the effects of vision and hearing difficulties after controlling for the effects of demographic, health, and lifestyle variables. The final step was to examine the combined effect of the interaction of vision and hearing deficits on life satisfaction after covarying the effects of the relevant variables.

Table 1 presents the means for study variables on sensory impairment. Comparison between participants with only mild or no visual impairment and those with much visual impairment revealed significant differences with respect to age (t (824) = -3.60, $p < .001$), chronic illnesses (t (824) = -4.25, $p < .001$), functional limitations (t (824) = -3.85, $p < .001$), physical activity (t (824) = -4.20, $p < .001$), perceived control

Table 1 ***Means (M) for Study Variables, by Sensory Impairment***

Variable	Level of Visual Impairment		Level of Hearing Impairment	
	None or Some (n = 732)	Much (n = 94)	None or Some (n = 769)	Much (n = 57)
Age	73.09	75.50***	73.19	75.75**
Education	3.44	3.28	3.40	3.68
Income	5.95	6.03	5.96	6.04
Chronic illnesses	1.98	2.49***	2.01	2.42**
Functional limitations	9.64	11.35***	9.69	11.79***
Story recall	.85	.96	.85	.95
Social support	70.66	70.24	70.74	70.16
Social activity	4.06	3.83	4.05	3.77
Physical activity	6.30	5.61***	5.82	5.67
Control	22.23	20.56***	22.12	20.84*
Life satisfaction	7.62	6.69***	7.68	6.72***

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 2 ***Correlations between Study Variables (n = 826)***

		2	3	4	5	6	7	8	9	10	11	12	13	14
1.	Age	.08*	-.13***	-.21***	.14***	.24***	.15***	.01	-.16***	.16***	-.03	.13***	.17***	.04
2.	Sex		-.11**	-.28***	.05	.19***	.05	.03	-.07*	.13***	.01	.01	-.10	.01
3.	Education			.36***	-.02	-.09*	-.21***	.03	.16***	-.21***	.04	-.02	.06	.16***
4.	Income				-.01	-.11**	-.10**	.04	.09*	-.10**	.02	.03	.01	.13***
5.	Illnesses					.38***	.10**	-.07*	.16***	.14***	-.17***	.19***	.16***	-.37***
6.	Limitations						.10**	-.05	-.38***	.41***	-.13***	.18***	.16***	-.33***
7.	Story recall							-.21***	-.17***	.23***	.11**	.03	.01	-.12***
8.	Social support								.15***	-.15***	-.07*	-.02	.02	.18***
9.	Social activity									-.32***	-.04	-.05	-.07*	.21***
10.	Physical activity										.03	.13***	.04	-.20***
11.	Control											-.14***	-.16***	.35***
12.	Vision												.14***	-.18***
13.	Hearing													-.14***
14.	Satisfaction													

* $p < .05$; ** $p < .01$; *** $p < .001$

(t (824) = 4.11, $p < .001$), and life satisfaction (t (824) = 4.23, $p < .001$). Comparison between participants with only mild or no hearing impairment and those with much hearing impairment revealed significant differences with respect to age (t (824) = -3.05, $p < .01$), chronic illness (t (824) = -2.71, $p < .01$), functional limitations (t (824) = 3.77, $p < .001$), perceived control (t (824) = 2.52, $p < .05$), and life satisfaction (t (824) = 3.47, $p < .001$). These results indicate that those with considerable vision or hearing loss are older and report significantly more chronic illnesses and functional limitations than those with little sensory impairment. The participants with visual impairment also reported significantly less physical activity. Both participants with visual impairment and those with hearing impairment reported less personal control and life satisfaction than those without sensory impairment.

Regression Analysis

Table 2 presents the correlations among the study variables. The significant correlations among predictors are low to moderate in value, indicating no multicollinearity among the variables. Because of the large sample size, however, most correlations are significant.

Hierarchical multiple regression analysis was used to examine the individual contribution of the four sets of variables — demographic, health, lifestyle, and sensory impairment — on life satisfaction. Table 3 presents the results of the standardized beta coefficients of these variables on self-reported life satisfaction.

In the first step of the hierarchical regression analysis, age, education, and income were significant predictors of life satisfaction and accounted for 4% of the variance. When health variables were entered in the second step, in addition to age, sex, education, and income, chronic illness and functional limitations were significant, with all variables accounting for 24% of the variance. The lifestyle variables were entered in the third step. In addition to the preceding variables, social support, social activities, and perceived control were all significant predictors of life satisfaction and accounted for 34% of the variance. Visual and hearing impairment were entered in the fourth step; all the preceding variables were significant, as was visual impairment. This step accounted for 36% of the variance. In the final step, which included interaction between visual and hearing impairment, all of the previous variables remained significant. The interaction between visual and hearing impairment was significant but did not significantly increase the amount of variance explained.

With regard to demographic variables, older women with lower levels of education and lower income reported less life satisfaction. Turning to health variables, participants with more chronic illnesses and greater functional limitations reported less life satisfaction. In addition, participants

Table 3 ***Standardized Beta Coefficients for Hierarchical Regression of Effects of Demographic, Health, Lifestyle, and Sensory Impairment Variables on Life Satisfaction (n = 826)***

Variables	Step 1 β	Step 2 β	Step 3 β	Step 4 β	Step 5 β
Demographics					
Age	.07*	.18***	.18***	.19***	.19***
Sex	.05	.11**	.09**	.09**	.09**
Education	.13***	.11**	.08*	.08*	.07*
Income	.12***	.13***	.12***	.12***	.12***
Health					
Chronic illnesses		-.29***	-.24***	-.23***	-.23***
Functional limitations		-.25***	-.18***	-.17***	-.17***
Story recall		-.06	-.06	-.06	-.06
Lifestyle					
Social support			.13***	.13***	.13***
Social activity			.08*	.08*	.08*
Physical activity			-.06	-.05	-.05
Control			.31***	.30***	.29***
Sensory impairment					
Vision				-.07*	-.08*
Hearing				-.04	-.05
Vision + hearing					.06*
R	.20	.49	.59	.60	.60
R^2	.04	.24	.34	.36	.36
R^2 change	.04	.20	.10	.01	.00

* $p < .05$; ** $p < .01$; *** $p < .001$

with less social support, fewer social activities, and less perceived control also reported less life satisfaction. The interaction between visual and hearing impairment, although significant, did not contribute additional explanatory power to the regression. Visual impairment had an independent negative effect on life satisfaction even after controlling for all the effects of the other variables, while hearing impairment had no independent effect on life satisfaction.

Discussion

This study examined the contribution of demographic, health, lifestyle, and sensory impairment variables on life satisfaction. As expected, the demographic, health, and lifestyle variables helped to explain life satisfaction. More interestingly, so did the sensory impairment variables. This demonstrates the importance of taking sensory impairment into account when considering the quality of life and life satisfaction of elderly people. The results show that, compared to people with little or no sensory impairment, those with visual or hearing impairment are older, have lower levels of education, and report significantly more chronic illnesses, functional limitations, and lack of control in their lives. The link between education and sensory deficits can be interpreted in different ways. It is possible that those with more education are more attentive to preventative care (Cacciatore et al., 1999) or that occupations requiring less education are wrought with greater health hazards. The results also suggest an adverse functional relationship between visual/hearing impairment and health status, functional limitations, and lower sense of control — that is, reduced sense of mastery — which appears to be a consequence of vision and hearing deficits in reducing life satisfaction. These results are similar to those of other studies, which have found that quality of life is adversely affected by hearing loss (Dalton et al., 2003) and poor vision (Lindö & Nordholm, 1999).

It is difficult to remain active and involved when confronted with a visual or hearing impairment. However, the participants with visual impairment reported significantly less physical activity than those with hearing impairment. This finding is consistent with that reported by Marx, Werner, Cohen-Mansfield, and Feldman (1992) for a sample of nursing home residents. The combination of vision loss and reduced sense of control could lead to greater fear of tripping and falling. Such fears can be real, as older people with visual impairment are at greater risk for falls (Lord & Dayhew, 2001; Tinetti, 2001). Similarly, the lower levels of physical activity among those with visual impairment can result in reduced ability to remain independent, such as travelling alone (Long et al., 1996). Although most elderly people in the sample wore glasses, several issues have been related to the use of glasses by older adults with visual impairment (Mann, Hurren, Karuza, & Bentley, 1993). Dissatisfaction with the devices may be related to the nature of the visual decline.

Consistent with the findings of Barzagan et al. (2001), differences were noted in the use of visual aids and the use of hearing aids. Participants with deficits were less likely to use hearing aids, confirming the findings of Popelka et al. (1998). Consequently, as noted by Dalton et al.

(2003), hearing impairment may more often go unrecognized and untreated, but even when listening aids are used, the results are less satisfactory, particularly in social situations. Therefore, it is likely that the effects of hearing difficulties on life satisfaction, in contrast to those of visual impairment, are more focused through social interaction, reducing their independent effects. These findings support the hypothesis that social and functional links can serve to predict hearing decline in the elderly (Levy, Slade, & Gill, 2006).

The results of this study suggest that individuals with self-reported visual and hearing impairment have significantly lowered life satisfaction. Even after the effects of other relevant variables that impact on life satisfaction are removed, vision deficits and the combination of vision and hearing deficits reduce life satisfaction. The failure to find a unique added adverse effect of the combination of hearing and vision deficits is surprising. Generally, however, the two types of deficit show the same pattern of association with health, age, and lifestyle variables. Consequently, it is likely that although their interaction has a significant effect on life satisfaction the limitations associated with the deficits are expressed similarly.

Although there are advantages and disadvantages to using secondary data sets when conducting research, secondary analysis of existing data sets has been employed by researchers as well by government agencies and various policy-making groups (Hakim, 1982; Hyman, 1972; Singleton, 1988). One drawback of such secondary analysis is that the researcher is forced to rely on the collection process used in the primary study, as well as the specific questions posed and the method of organization employed in that study (Hakim). The present study used basic self-report measures to determine sensory impairment status; this served to limit the findings because the validity of self-report measures in the assessment of vision and hearing has been questioned. Indeed, the use of self-report measures tends to underestimate the prevalence of hearing loss, as noted by Nondahl et al. (1998). Dalton et al. (2003) recommend that future studies consider using standardized audiometric techniques to investigate the relationship between hearing impairment assessed objectively or by self-report and life satisfaction. The present study was limited to the items developed for the survey conducted by Béland et al. (1998). Nevertheless, as noted by Barzagan et al. (2001), the subjective evaluation of sensory impairment is warranted because subjective beliefs also play a role in one's evaluation of life satisfaction. Another limitation stems from the selection of the sub-sample, since only those participants with complete data sets were chosen.

The findings have clinical implications for health professionals. Appollonio et al. (1996) argue that quality of life must be taken into

account in the provision of sensory aids to elderly people. Indeed, many studies have found that sensory aids improve quality of life (Reuben, Mui, Damesyn, Moore, & Greendale, 1999). For instance, Brenner et al. (1993) found that quality of life improved when visual function was improved. The use of hearing aids, if properly fitted, could serve to reduce poor quality for life in elderly people (Mulrow et al., 1990). However, older adults with a hearing impairment often fail to seek professional care (Yueh, Shapiro, MacLean, & Shekelle, 2003). Mahoney, Stephens, and Cage (1996) found that it is usually a family member who persuades the patient to consult a professional. Thus, from a clinical perspective, an emphasis should be placed on detecting sensory impairment and educating the elderly who are at risk; this could have a positive impact on their quality of life (Barzargan, Baker, & Bazargan, 1998; Barzagan et al., 2001; Dalton et al., 2003). More specifically, health-care providers such as nurses can play a key role in helping older adults to enhance their life satisfaction by identifying sensory impairments and providing information and assistance with adaptation (Bogardus et al., 2003; Kelly, 1995). For example, nursing personnel can be easily trained to use screening devices such as audioscopes or to provide information to both patients and families on the nature of hearing loss and means of increasing comprehension (Bogardus et al.). In addition, health professionals can encourage older people to extend their range of physical activities and help them to achieve a greater sense of control and well-being through the use of corrective devices and compensatory techniques.

Clearly, the findings reported here must be confirmed and extended. Research is needed to clarify the role that access to intervention services, health, and psychosocial factors play in screening for and the use of aids for sensory impairment and, ultimately, in life satisfaction (Green & Pope, 2001; Lee, 2001). In addition, the impact of sensory loss on physical activity and social participation should be further examined (Crews & Campbell, 2004). As noted by Levy et al. (2006), researchers need to take age stereotypes into account. Future research should also address the hypothesis that hearing deficits influence life satisfaction indirectly and that vision deficits have pervasive effects on functioning, including direct effects on life satisfaction.

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