
S. Dahlin Ivanoff, U. Sonn, E. Svensson

Key Words
• aging
• evaluation process, occupational therapy
• macular degeneration

OBJECTIVE. The purpose of this randomized, longitudinal study was to investigate the impact of a health education program on perceived security in the performance of daily occupations 4 months after the intervention period.

METHOD. Two groups of persons with age-related macular degeneration were compared: Those who had followed a newly developed health education program that was based on occupation and those who took part in a standard individual intervention program.

RESULTS. Significant differences in the level of perceived security between the groups were found for 13 of 28 occupations. Participants in the health education group maintained or improved their level of perceived security in 22 daily occupations, whereas those in the individual intervention group declined to a lower level in 17 daily occupations.

CONCLUSION. This study provides support for the effectiveness of the health education program to enhance security and hinder a progressive decline in perceived security in daily occupations.

Considerable evidence exists that educational programs designed to prevent or delay the onset of problems in daily occupations for the purpose of promoting health and independent living among older persons are important (Carlson, Clark, & Young, 1998; Caserta, 1995; Jackson, Carlson, Mandel, Zemke, & Clark, 1998). Health education may be a useful tool in this respect, but programs for elderly persons with age-related macular degeneration are lacking (Dahlin Ivanoff, 2000).

Age-related macular degeneration is a progressive, chronic disease of the central part of the retina. It is characterized by the loss of central vision and that it rarely leads to total blindness. The prevalence of age-related macular degeneration causing visual impairment increases dramatically with age (Klein, Klein, & Lee, 1996). Population studies show that about 28% of persons 75 years of age or older are affected by age-related macular degeneration (Leibowitch, Kreuger, Maunder, & Milton, 1980; Vinding, 1995). Because no cure exists for the majority of persons, this chronic impairment represents an important public health problem.

Loss of central vision affects the performance of several daily occupations, and persons with age-related macular degeneration have been found to need more help in daily occupations than elderly people in general (Williams, Brody, Thomas, Kaplan, & Brown, 1998). Problems in performing daily occupations have become important indicators of disability (Jette, 1994; Sonn, 1996; Verbrugge & Jette, 1994). Early detection of problems in daily occupation may improve the likelihood of successful aging because gaining ability in one daily occupation may prevent the loss of another occupation (Crimmins & Saito, 1993). Self-perceptions of
problems related to performing daily occupations, therefore, must be detected to inform the content of intervention and to permit early intervention.

A health education program targeting elderly persons with age-related macular degeneration, named Discovering New Ways (Dahlin Ivanoff et al., 1996; Dahlin Ivanoff, Klepp, & Sjöstrand, 1998), was based on the target group’s own perception of problems in daily occupations. Focus group methodology was used to enable the target group to participate in the planning and development of the program. One of the earliest signs of occupational dysfunction that persons with macular degeneration perceive is a sense of insecurity (lack of confidence) while performing daily occupations. Therefore, the main goals of the Discovering New Ways program were to sustain and restore participants’ perceived security in performance of daily occupations and to enable early detection of persons with perceived insecurity (Dahlin Ivanoff et al., 1996; Dahlin Ivanoff et al., 1998). The purpose of this study was to investigate the impact of the health education program on perceived security in the performance of daily occupation 4 months after the intervention.

Method
Participants
The study was carried out at low vision clinics at two university-affiliated hospitals in Sweden. The target group comprised all persons who were referred to rehabilitation by an ophthalmologist and who were attending the low vision clinic for the first time. The inclusion criteria were as follows: (a) 65 years of age or older, (b) living at home, (c) diagnosed aged-related macular degeneration as the primary condition, (d) a distance visual acuity of the better eye with best correction no lower than .1, and (e) ability to participate in group discussions. The Ethics Committee of the faculty of medicine at the university approved the study. All participants gave informed consent to taking part in the study.

A total of 347 persons referred to the low vision clinics between January 1996 and December 1997 met the inclusion criteria and were asked consecutively to participate in the study. Of these, 253 (73%) participated. The main reason given for not participating in the study was poor health (59%). The same selection procedure was used at both low vision clinics, and the lack of difference between the baseline characteristics of the two sets of participants meant that they could be treated as one group.

Procedure
The participants were randomly assigned, according to a special table, either to the health education program or to an individual intervention program that was standard at the low vision clinic. The occupational therapists who collected the data for the research were not blind to the composition of the groups but were not involved in the intervention programs.

Evaluations at baseline and at the 4-month follow-up were made when the participants in the health education program and in the individual intervention program attended the low vision clinic. The study procedure did not differ between the programs. Independent registered occupational therapists interviewed the participants according to a structured protocol that consisted of questions about marital status, living arrangements, social service, and health problems. An assessment of perceived security in performing daily occupations (Dahlin Ivanoff, 2000; Dahlin Ivanoff, Sonn, & Svensson, 2001) also was completed; details about this assessment follow in the next section. An optometrist made the optical evaluation during the visit. Visual acuity was tested with a letter chart (Monoyer-Granström, Kifa), graded .1 to 1.0 at a distance of 5 m, with the person’s own eyeglasses and with best refraction.

The study was designed so that the follow-up took place 4 months, 1 year, and 2 years after the intervention was completed. Sixty-six persons dropped out of the study (36 from the individual intervention program, 30 from the health education program) at the time of the 4-month follow-up, and this report is based on the 187 persons (94 for individual intervention program, 93 for the health education program) who were still participating.

Instrument
The instrument for measuring the primary outcome—perceived security in performing daily occupations (Dahlin Ivanoff, 2000; Dahlin Ivanoff et al., 2001)—was developed for the purpose of evaluating the health education program. The instrument is a questionnaire that consists 29 items divided into 7 performance areas: meals, self-care and care of clothing, communication, cleaning, mobility, shopping, and financial management. Perceived confidence in performing each task is rated on a 4-point ordinal scale (very insecure, insecure, quite secure, secure). The participants completed the questionnaire after instructions from the occupational therapists. For those who had trouble reading, the occupational therapists read the questions and response alternatives. The participants also were given the response alternatives in large print. Participants were instructed to assess their actual performance and how they managed at that very moment. They had to perform the activity independently, and in those activities where they asked for help only occasionally, the performance was regarded as inde-
dependent. Participants were instructed to leave out activities that they did not perform.

The reliability and responsiveness of each item in the instrument were evaluated by a nonparametric method for rating scales (Svensson, 1993). By this statistical method, a comprehensive test–retest evaluation was made with regard to agreement, possible bias, and intraindividual variability. The assessment (Dahlin Ivanoff et al., 2001) showed a high level of agreement (57%–85%, median = 69%), a high level of within-subject stability (the participants assessed themselves as having the same level of security on both occasions), and lack of bias. In the test of responsiveness, the participants assessed themselves as having a higher level of security at the evaluation compared with baseline, and the measures of this significant change indicated a high level of responsiveness of the items in the instrument. The instrument also has been tested for face validity and content validity (Dahlin Ivanoff, 2000; Dahlin Ivanoff et al., 2001).

**Intervention with the health education program.** Groups of 4 to 6 participated in the health education program for a total of 20 formed consecutively during the study period. The intervention period for each group was 8 weeks, and the groups met once a week for 2 hr. The Health Education Model is described in Figure 1. The development of the program and its theoretical basis have been described elsewhere (Dahlin Ivanoff et al., 1996; Dahlin Ivanoff et al., 1998).

The groups were led by occupational therapists, and each group always had the same leader. The therapists were experienced in leading groups and trained in the methodology and theoretical foundations of the program before the start of the study. The occupational therapist provided information and skills training based on the occupational categories (see Figure 1) and guided and encouraged the participants in the learning process. Other health professionals, such as an ophthalmologist, an optometrist, a low vision therapist, and a light expert, were invited to give information.

The information and the skills training were derived from strategies elderly persons with age-related macular degeneration use to continue to perform daily occupations (Dahlin Ivanoff et al., 1996). The strategies were presented within the program as a problem-solving model, and the participants were taught to use the model as a way of thinking when performing daily occupations.

A booklet containing the information given by health professionals as well as information about occupational categories was used in the health education program. The participants were asked to prepare themselves before participating in the sessions by reading relevant chapters and formulating questions.

---

**Figure 1. The Health Education Model for the health education program, Discovering New Ways. A description of the theoretical basis, the content, the tools for learning, and the goals of the program.**

**Intervention with the individual intervention program.** The individual intervention program was the standard intervention for the target group at the low vision clinics. The participants were provided with optical aids with the aim to improve reading and near and distance viewing. Hand and stand magnifiers as well as eyeglasses for reading were prescribed. The participants were given information about the disease if they requested it. The individual intervention measures were carried out by an occupational therapist with special training in low vision. The individual intervention typically included one to two 1-hr sessions at the clinic, with follow-up phone calls over a 4-week period.

**Statistical Analysis**

To describe the results, the median and range of the questionnaire ratings on perceived security were calculated. The 95% confidence interval for difference in proportions between participants and nonparticipants and dropouts were calculated with exact formulas for the binomial distribution. Chi-square was used to test differences in the proportions of perceived security at baseline between the groups (Altman, 1991). The effects of the health education program on changes in perceived security in occupational
performance were evaluated with a nonparametric statistical approach developed for evaluation of change in ordered categorical data (Sonn & Svensson, 1997; Svensson, 1998). By this method, it is possible to measure the level of systematic change in common for the study group members separately from additional individual change in the group unexplained by the systematic group change. Two measures of systematic group change are defined in this approach: A systematic change in position on the scale is measured by the relative position (RP), and a systematic change in how the evaluations are concentrated on the scale categories is expressed by relative concentration (RC). Possible values of RP and RC range from –1 to 1. A 0 value means lack of systematic change.

The four categories of perceived security in each item were very insecure (1), insecure (2), quite secure (3), and secure (4) (see Figure 2). The intervention effect on the level of security in performance of each item was evaluated in four steps.

**Step 1.** The intervention effect of each performance was evaluated by studying the frequency distribution of the pairs of item ratings of perceived security before and after intervention displayed in contingency tables. The main diagonal of unchanged level of perceived security is orientated from the lower-left corner to the upper-right corner in this approach (see Figure 2). Figure 2a shows that 42 (29 + 8 + 5) of 84 (50%) participants rated the same level security or insecurity on the two occasions.

**Step 2.** A presence of systematic change in perceived security in performance is evident from the categorical distributions of responses on each occasion (also called the marginal distributions). In Figure 2a, the marginal distributions are 0, 14, 19, and 51 at baseline and 4, 15, 27, and 38 at the 4-month evaluation. The two sets of marginal distributions differ, which indicates a systematic change in perceived security over time in common for the group. This systematic group change can be visualized by plotting the two sets of cumulative proportions against each other, starting with the point 0.0. The two sets of cumulative proportions of the marginal distributions are 0, .17, .39, and 1 at baseline and .05, .23, .55, and 1 at 4-month evaluation. The plot forms a relative operating characteristic (ROC) curve, also called a Q-Q-plot. A curve below the diagonal of equal cumulative distributions indicates an improvement (see Figure 2b), and a curve above the diagonal indicates deterioration (see Figure 2a). By this curve, it is easy to identify the items of the most pronounced intervention effect on occupational performance over time that are in common for the group.

**Step 3.** A concave or a convex ROC curve indicates systematic group change in position of the categories of perceived security. The difference between the probabilities of systematic improvement and deterioration is the RP, which ranges from −1 to 1; an RP of 0 means lack of systematic change in perceived security in common for the group.

As can be seen in Figure 2a, the two sets of marginal distributions differ, and the ROC curve for the activity “finding your way in your local shop” shows that the participants perceived themselves as more insecure (curve above the diagonal) after the intervention, which is confirmed by the negative value of RP (−.16).

In Figure 2b, the ROC curve for the activity “writing a memo to yourself” shows that the participants perceived themselves as more secure (curve below the diagonal) after the intervention, which is confirmed by the positive value of RP (.46). The systematic change in perceived security after intervention was more pronounced for this activity because the RP value was closer to unity.

When a systematic shift in concentration of the scale ratings occurs, the ROC curve is S-shaped. This shift could happen when the assessment ratings are concentrated on a central part of the scale on one occasion and systematically change toward the extreme categories on another occasion. The difference between the probabilities of one set of marginal distributions being concentrated between the other and vice versa defines the measure of RC. A negative value indicates a systematic change toward the extreme categories, and a positive value indicates a systematic change toward the central part of the scale. The ROC curve in Figure 2c is slightly S-shaped, which indicates a systematic change in concentration of the distribution of the categories of perceived security. The value of RC is positive (.16), which indicates a change in ratings toward the central part of the scale. The ROC curve also shows a slight systematic change in position toward a lower level of security after intervention (RP = −.07).

**Step 4.** In addition to systematic changes in perceived level of security after intervention, the dispersed observations in the contingency table indicate additional individual variations in change in the group between the two occasions. The level of individual variation in changes over time is measured by the relative rank variance (RV). The higher the value of RV (0 ≤ RV ≤ 1), the more heterogeneous the individual changes.

Figure 2b demonstrates a case with a high level of systematic change in perceived security, as evident from the marginal distributions and the deviation of the ROC curve from the diagonal. The frequency distribution of paired ratings in the contingency table shows a large amount of individual variation in changes of perceived security in the group. For example, 14 participants rated themselves as being quite secure (3) at baseline, and 1 felt very insecure (1).
Figure 2. Contingency tables on the distribution of the frequencies of the participants' ratings of perceived security in daily occupations (1 = very insecure, 2 = insecure, 3 = quite secure, 4 = secure) at baseline and at the 4-month evaluation and relative operating characteristic (ROC) curves of the occupations (2a) “finding your way in the local shop” (individual intervention program, relative position [RP] = –.16, relative concentration [RC] = .02, relative rank variance [RV] = .14), (2b) “writing a memo to yourself” (health education program, RP = .46, RC = .12, RV = .12) and (2c) “picking the right product” (individual intervention program, RP = –.07, RC = .16, RV = .16).
and 8 secure (4) at the 4-month evaluation. The 71 participants are distributed on almost all 16 cells of the contingency table, so a high level of individual changes is unexplained by the systematic change. In this case, the RV is .34.

The standard errors of RP, RC, and RV were calculated by means of the jackknife technique (Svensson, 1993), and the 95% confidence intervals are given. When the confidence intervals do not include the 0 value, strong evidence exists for significant change between the evaluation occasions within the group. When the confidence intervals for the two groups do not overlap, strong evidence exists for a significant difference in the intervention effect change between the groups.

**Results**

**Baseline Characteristics**

The median age was 79 years (range = 66–94) for the health education group and 79 years (range = 65–91) for the individual intervention group. The baseline visual acuity (best eye) of the health education group ranged from .1 to 1.0 (median = .3), whereas that of the individual intervention group ranged from .1 to .9, (median = .3).

The nonparticipants (n = 94) and dropouts (n = 66) showed a significant difference from the participants with a higher proportion of use of public transportation service (95% CI, 7–23 vs. 9–35) and social service (95% CI, 6–18 vs. 9–35). The nonparticipants also demonstrated a significantly lower proportion of perceived good health than the participants (95% CI, 6–18 vs. 9–35).

No significant difference between the health education group and the individual intervention group was found at baseline with respect to self-reported health problems, perceived good health, use of the public transportation service, and social service. The median levels of perceived security differed between the individual intervention group and the health education group with regard to five activities at baseline: measuring ingredients (meals) (secure vs. quite secure); knowing your turn in the queue (secure vs. quite secure); filling in a withdrawal form (quite secure vs. insecure); reading a bank statement (financial management) (quite secure vs. insecure); and writing a memo to yourself (communication) (quite secure vs. insecure).

**Level of Systematic Group Change in Perceived Security in Performance of Daily Occupations**

The study showed significant differences in systematic change in perceived security between the health education group and the individual intervention group in several occupations at the 4-month evaluation (see Table 1). The individual intervention group showed changes toward a lower or unchanged level of perceived security in 23 of 28 daily occupations. The RP values in 17 daily occupations for this group were negative, and of all 28 occupations, all but 5 confidence intervals had at least 1 limit of a negative RP value. The RP ranged from −.16 to .34 (median = −.03). The individual intervention group changed systematically to a higher level of perceived security in 5 daily occupations: “threading a needle and sewing a button on” (RP = .31), “reading an article in your newspaper” (RP = .031), “following the news on your TV” (RP = .17), “knowing the price on the products” (RP = .17), and “reading a bank statement” (RP = .15).

The health education group showed changes toward an improved level of perceived security in 22 daily occupations, as all but 6 confidence intervals of RP were positive. The RP ranged from .03 to .51 (median = .20). The most pronounced systematic change in perceived level of security were found in 3 daily occupations: “reading an article in your newspaper” (RP = .51), “writing a memo to yourself” (RP = .46), and “reading a bank statement” (RP = .39). The systematic change in the item “writing a memo to yourself,” as illustrated by the ROC curve (see Figure 2b), indicates an increased feeling of security after the intervention.

The non-overlapping confidence intervals for systematic change in position between the two groups indicate significant differences in the intervention effect on perceived security of 13 daily occupations. For example, a systematic change toward a lower level of security in “finding the way in local shop” was found in the individual intervention group (RP = −.16, 95% CI = −.32 to −.04), whereas a systematic change toward a higher level of perceived security was found in the health education group for the same occupation (RP = .11, 95% CI = .01–.21). The occupations “measuring ingredients for making coffee,” “deciding if the vegetables are clean,” “discovering if your clothes are stained,” “writing a memo to yourself,” and “dialing on your phone” are examples of systematic changes toward a lower level of security as found in the individual intervention group and a systematic change toward a higher level of perceived security as found in the health education group (see Table 1).

In addition to systematic changes in RP, systematic changes in RC were found, meaning that a limited part of the scale was used at baseline and systematically changed toward the extreme categories, or vice versa, at the 4-month evaluation (data not shown). Within the individual intervention group, the level of security in the occupations “cutting/filing the nails” (RC = .21, 95% CI = .07–.35), “discovering if your clothes are stained” (RC = .18, 95% CI = .01–.35), “dialing on your phone” (RC = .19, 95% CI = .09–.29), “picking the right product” (RC = .16, 95% CI = .04–.28), “knowing
your turn in the queue” (RC = .15, 95% CI = .01–.29), and “reading a bank statement” (RC = .21, 95% CI = .07–.35) indicated a group change in concentration of the level of security. In the health education group, the level of security in the occupations “managing the knobs of the stove” (RC = .32, 95% CI = .2–.44), “slicing bread” (RC = .14, 95% CI = .02–.26), and “dusting your apartment” (RC = .23, 95% CI = .05–.42), changed toward a secure level and the central parts of the categories after the intervention.

Level of Individual Change of Perceived Security in Performance of Daily Occupations

Besides the significant changes in perceived security on a group level, individual changes in perceived security were found in both groups, which means that evidence of heterogeneity in intervention effects exists in both groups. The values of RV among the participants in the health education group ranged from .05 to .34 (median = .13). The RV values in the individual intervention group ranged from .02 to .28 (median = .11) (data not shown). The highest values of individual change between the individual intervention group and the health education group were found in the occupations “reading an article in your newspaper” (RV = .24, 95% CI = .1–.38, vs. RV = .30, 95% CI = .12–.48), “writing a memo to yourself” (RV = .17, 95% CI = .05–.29, vs. RV = .34, 95% CI = .14–.44), and “knowing the price on the products” (RV = .12, 95% CI = .02–.22, vs. RV = .32, 95% CI = .16–.48).

Discussion

The purpose of this study was to investigate the impact of a health education program on the level of perceived security in performance of daily occupations at 4-month evaluation in persons who have age-related macular degeneration. The study revealed significant differences between the groups in 13 daily occupations. The health education group improved toward a higher level of security (RP) in 22 daily occupations than the individual intervention group, which showed changes toward a lower or unchanged level in 23

<table>
<thead>
<tr>
<th>Daily Occupation</th>
<th>Individual Intervention Group</th>
<th>Health Education Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pouring out coffee/tea for yourself</td>
<td>94 .06 –.06 to .18</td>
<td>93 .26 .14 to .38</td>
</tr>
<tr>
<td>2. Finding food which is on the plate</td>
<td>94 –.13 –.23 to .03</td>
<td>93 .03 –.07 to .13</td>
</tr>
<tr>
<td>3. Finding things on the table eating</td>
<td>94 –.09 –.11 to .09</td>
<td>92 .10 –.02 to .2</td>
</tr>
<tr>
<td>4. Finding utensils and supplies in closet/box*</td>
<td>93 –.09 –.21 to .03</td>
<td>91 .16 .04 to .28</td>
</tr>
<tr>
<td>5. Measuring ingredients for making coffee*</td>
<td>93 –.02 –.12 to .08</td>
<td>89 .31 .19 to .43</td>
</tr>
<tr>
<td>6. Deciding if the vegetables are clean*</td>
<td>94 .005 –.10 to .15</td>
<td>91 .30 .16 to .44</td>
</tr>
<tr>
<td>7. Managing the knobs on the stove*</td>
<td>85 –.09 –.21 to .03</td>
<td>85 .22 .08 to .36</td>
</tr>
<tr>
<td>8. Slicing bread</td>
<td>85 .02 –.10 to .14</td>
<td>86 .08 –.08 to .24</td>
</tr>
<tr>
<td>9. Deciding if the dishes are clean*</td>
<td>88 –.11 –.23 to .01</td>
<td>88 .14 .02 to .26</td>
</tr>
<tr>
<td>10. Cutting/filing the nails*</td>
<td>83 –.05 –.17 to .07</td>
<td>83 .22 .08 to .36</td>
</tr>
<tr>
<td>11. Discovering if your clothes are stained*</td>
<td>90 –.09 –.21 to .03</td>
<td>89 .18 .06 to .30</td>
</tr>
<tr>
<td>12. Threading a needle and sewing on a button</td>
<td>53 .31 .13 to .49</td>
<td>44 .45 .29 to .61</td>
</tr>
<tr>
<td>13. Reading an article in your newspaper</td>
<td>69 .34 .20 to .48</td>
<td>62 .51 .37 to .65</td>
</tr>
<tr>
<td>14. Writing a memo to yourself*</td>
<td>76 .05 –.09 to .19</td>
<td>71 .46 .30 to .62</td>
</tr>
<tr>
<td>15. Following the news on your TV</td>
<td>92 .17 .03 to .31</td>
<td>88 .37 .23 to .51</td>
</tr>
<tr>
<td>16. Dialing on your phone*</td>
<td>94 –.07 –.21 to .07</td>
<td>92 .24 .10 to .38</td>
</tr>
<tr>
<td>17. Vacuuming your apartment</td>
<td>69 –.13 –.25 to .01</td>
<td>72 .09 –.05 to .23</td>
</tr>
<tr>
<td>18. Dusting your apartment</td>
<td>59 –.13 –.27 to .01</td>
<td>56 .06 –.10 to .22</td>
</tr>
<tr>
<td>19. Going to your local shop</td>
<td>81 –.03 –.13 to .07</td>
<td>83 .14 .02 to .26</td>
</tr>
<tr>
<td>20. Using a pedestrian crossing with traffic lights</td>
<td>85 –.03 –.15 to .09</td>
<td>86 .12 .00 to .24</td>
</tr>
<tr>
<td>21. Distinguishing irregularity in the streets as (e.g., a curb)*</td>
<td>90 .02 –.08 to .12</td>
<td>91 .25 .14 to .35</td>
</tr>
<tr>
<td>22. Shopping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Finding your way in your local shop*</td>
<td>84 –.16 –.32 to .04</td>
<td>85 .11 .01 to .21</td>
</tr>
<tr>
<td>24. Picking the right product</td>
<td>85 –.07 –.21 to .07</td>
<td>84 .14 .02 to .26</td>
</tr>
<tr>
<td>25. Knowing the price on the products</td>
<td>73 .17 .05 to .29</td>
<td>77 .28 .12 to .44</td>
</tr>
<tr>
<td>26. Managing money and paying</td>
<td>88 –.15 –.25 to .05</td>
<td>90 .05 .07 to .17</td>
</tr>
<tr>
<td>27. Financial management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Knowing your turn in the queue*</td>
<td>74 –.11 –.21 to .01</td>
<td>77 .18 .06 to .30</td>
</tr>
<tr>
<td>29. Filling in a withdrawal form</td>
<td>71 .04 –.10 to .18</td>
<td>65 .26 .12 to .40</td>
</tr>
<tr>
<td>30. Reading a bank statement*</td>
<td>77 .15 .08 to .22</td>
<td>71 .39 .25 to .53</td>
</tr>
</tbody>
</table>

Note: Item 16 was omitted from the instrument (“reading the text on your TV”) because the number of responses was too small.

* Items with significant differences between groups.
occupations. No difference in RC values was found between the groups, although the health education group changed toward a higher level of security, which was confirmed by the positive values of RP. Besides the systematic changes, evidence showed heterogeneity in intervention effects in both groups, but no difference in RV was found between the groups. One-year and 2-year follow-up evaluations are planned to examine the long-term stability of the outcome.

It should be borne in mind that the participants in the study were elderly persons still living at home and functioning rather well. The nonparticipants and dropouts had to make more use of the social service and public transportation service, which indicates more disability. Hence, because one of the main goals of the health education program was to enable the early detection of persons perceiving insecurity when performing daily occupations, the nonparticipants and dropouts were already too ill to take advantage of the program.

Randomization is a method of eliminating bias in data, but it does not guarantee that the characteristics of the different groups are similar. In this study, the baseline characteristics of perceived health, self-related health problem, and visual acuity were similar for both groups at the start of the trial, but the individual intervention group participants perceived themselves as more secure in 5 of the 28 occupations. Despite being more secure at baseline, they deteriorated in 2 and maintained the level in 1 of those 5 occupations. The blinding technique for participants and evaluators (Altman, 1991) was not applied with regard to the treatment or the composition of the groups. The participants needed to know what service they were going to receive, and the open questions in the research interview revealed the nature of the group. The evaluators were not involved in the intervention, which may not have been a serious limitation because measurement of the outcome was based on self-reports.

One of the goals of the health education program was to sustain and restore the participants’ levels of perceived security in performance of daily occupations. This goal was realized because the participants in the health education program perceived higher security (RP) in all areas of daily occupations. The individual intervention group participants improved their perceived security (RP) in five daily occupations, primarily in those related to reading. However, this group demonstrated a lower level of security in areas such as meals, cleaning, mobility, and shopping—all tasks related to the ability to live an independent life—than the health education group.

The fact that the participants themselves were involved in planning and developing the program means that the program is likely to be effective (Carter, McKenna, Martin, & Andersen, 1989; Minkler & Checkoway, 1988). This involvement might account for the success of the health education program. Developing the program with elderly persons experiencing occupational problems because of age-related macular degeneration made it possible to tailor the intervention. They are expert in their own occupational function and can best express their needs and make choices about their occupations (Law, Baptiste, & Mills, 1995).

By choosing persons who had a visual acuity level of .1 to 1.0, we were able to capture early signs of decline in perceived security in daily occupations. As occupational therapists, we can guide, coach, encourage, or use other approaches to help persons in the process of increasing their sense of security while performing daily occupations. This increase in security comes from learning new ways of managing daily occupations; a willingness to try; success; and, thus, more confidence about performing daily occupations. The tools of learning—skills training, group methodology, and information about the disease and its consequences—are important to fostering increased security and a sense of competence. For a change in occupational performance to take place, it is important to regain a feeling of competence (Stretcher, Vellis, Becker, & Rosenstock, 1986). Meeting others with the same disease, discussing it with persons who understand, imparting information, and being aware of not being the only one with the disease are highly valued. Rebeiro and Cook (1999) emphasized that gathering together persons who have similar circumstances creates an environment of trust that is conducive to good health.

The booklet used in the program made it possible for the participants to prepare a theme in advance by formulating questions for the meeting. Formulating questions before a health visit has been found to be an effective way to achieve a better health outcome (Greenfield, Kaplan, & Ware, 1985; Roter, 1977). An important aspect of the program was the use of strategies as a problem-solving model, a way of thinking that the participants learned during the health education program. This model gave the participants the opportunity to consider how they would like to change their daily occupations, to feel more secure, and to regain the feeling of competence in daily occupations. Clark et al. (1996) stated that suggesting and teaching strategies should be incorporated to offer a successful occupational therapy program.

Conclusion

The findings support the view that the health education program is effective, as the results show significant differences in perceived security between the health education and individual intervention groups in 13 occupations, and health education group participants perceive themselves as
more secure after intervention in 22 daily occupations. The health education program may slow the progressive decline in perceived security in performance of daily occupations and provide early detection of persons perceiving insecurity when performing daily occupations. Our findings suggest that programs founded on the needs and problems of elderly persons and the tools of learning (skills training, group methodology, information) may be important means of enabling people to maintain a sense of security in daily occupations.

Acknowledgments
This study was supported by grants from Synfrämjandets Research Found, “KMA,” and Vårdal Foundation. We thank Professor Johan Sjöstrand for valuable comments on the manuscript.

References