

"This is the pre-peer reviewed version of the following article:

Tøien, M., Bjørk, I. T., Fagerström, L. (2017) An exploration of the factors associated with older users' perceptions of the benefits of and satisfaction with a preventive home visit service. *Scandinavian Journal of Caring Sciences*.

which has been published in final form at [10.1111/scs.12555](https://doi.org/10.1111/scs.12555).

This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Use of Self-Archived Versions."

An exploration of the factors associated with older users' perceptions of the benefits of and satisfaction with a preventive home visit service.

Mette Tøien¹, Ida Torunn Bjørk² and Lisbeth Fagerström¹

University College of Southeast Norway, Drammen, Norway
University of Oslo, Oslo, Norway

Scandinavian Journal of Caring Sciences. 2017,0(0).

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: [10.1111/scs.12555](https://doi.org/10.1111/scs.12555).

This article is protected by copyright. All rights reserved.

Full title

An exploration of the factors associated with older users' perceptions of the benefits of and satisfaction with a preventive home visit service.

Authors

Mette Tøien¹, Ida Torunn Bjørk² and Lisbeth Fagerström¹

¹University College of Southeast Norway, Drammen, Norway

²University of Oslo, Oslo, Norway

Corresponding Author:

Mette Tøien, Department of Nursing and Health Sciences, University College of Southeast Norway, PB 7053, 3007 Drammen, Norway.

Email: mette.toien@usn.no

ABSTRACT

Background: Preventive home visits (PHV) are healthcare services aimed at promoting the health of home-dwelling older people to support their abilities to live independently. To enhance effectiveness, studies that explore older persons' experiences of PHVs are needed.

Objective: To assess older persons' benefits and opinions of a PHV service and explore the associations between relevant sociodemographic/health-related factors and the persons' perceived benefits from PHV.

Theory: The study was based on a comprehensive understanding of health, as including objective health/disease, subjective health/ wellbeing and coping ability.

Methods: A cross-sectional survey was administered during spring 2013 in a Norwegian municipality where nurses had offered annual PHVs to residents aged 75 years and older since 1999. We invited a stratified random sample of 393 PHV users to participate; of these, 161 volunteered. We applied a specially developed questionnaire. Frequency distribution / percentages were used for the evaluation of the main outcome items, and logistic regression models measured the associations between sociodemographic/health-related background variables and each outcome variable.

Results: Approximately 39% of the respondents indicated that PHVs added to their feelings of safety; 66% reported support for ability to live at home; 72% reported support for having a good life, 83% were satisfied with the service, and 90% stated that PHVs are important for older people. Feelings of safety increased with age. Poor physical health and not living alone were associated with perceptions of more support for living at home. Having children reduced perceived support for a good life. Satisfaction with PHV increased with scores on the life orientation scale. Persons with poor mental health and those not living alone more often perceived PHV as important.

Conclusions: Annual, comprehensive PHVs may support older persons' health, thriving and independence. Low response rate limits the reliability of data and restricts the possibility to generalize the results.

Keywords: older people; community health nursing; preventive home visits; health promotion; evaluation; quantitative research

Word Count: Abstract: 300, Main text: 4933 Author contributions and Funding: 67

INTRODUCTION

Demographic changes in Western countries have led to an increased focus on preventive initiatives to maintain older individuals' health and abilities to stay independent in order to reduce the need for more resource-demanding healthcare services (1, 2). One such initiative is preventive home visits (PHVs) that involve regular but infrequent visits to home-dwelling individuals before their health status deteriorates. During PHVs, a health professional assesses an older person's situation and offers support to promote health and sustain functional ability and independence (3, 4). The concept of PHV includes a broad variety of interventions that vary based on the aims, approach, scope, content, and follow-up strategy as well as the target population and the visitors' professional competences (5-7).

Knowledge from evaluation-studies of healthcare services can be used to assess their value, and to improve the services' quality and relevance (8). Numerous studies of PHVs with a mainly disease preventive focus have evaluated outcomes defined by professionals or policymakers, including objective health outcomes such as morbidity, mortality, and health care costs (9-11). Recent Scandinavian PHVs reflect a more comprehensive understanding of health including health-promotion strategies to enhance subjective health and coping (12-14), and qualitative PHV studies suggest that older people may value outcomes related to well-being, empowerment, and feeling of safety / security (15-17). The relevance of the outcomes applied in previous evaluations have therefore been questioned (11, 18, 19).

Sound judgement of the value of healthcare services includes benefits for service users (8). Information about what the users consider as valuable and useful help is also necessary to improve service quality. Therefore, a growing demand exists for researchers to incorporate users' experiences and opinions when evaluating healthcare services (20-22). Researchers have underscored the need to include older persons' experiences to define relevant outcomes for

assessments of users' opinions of PHVs (10, 15). Knowledge about how older persons perceive a service is especially important for non-compulsory services such as PHVs. The effectiveness of these programmes depends on whether older people accept them and how they utilise them, whether the service meets individual needs and preferences, and whether the older persons adhere to recommendations (17). Despite this, we found no previous studies that reported older individuals' evaluations of PHVs in relevant electronic databases. The present study contributes within this scope.

Local municipality authorities requested that this study investigate older persons' perspectives as part of a comprehensive evaluation of a PHV service, to inform judgements of effectiveness and to improve the service. To identify relevant outcomes for this particular PHV service, we previously conducted a qualitative interview study with ten older persons who had long experience with the PHV service (23). The informants described benefits from the service within three main categories: To feel safe, to manage everyday life, and to live well in their own homes (23). To increase the understanding of older persons' experiences with and opinions of PHV, the current article therefore presents results of a cross-sectional survey which included outcomes based on PHV users' perceived benefits from the service (23). Additional outcomes were satisfaction with PHV and perceived importance of the service. We also explored if benefits from the service were associated with factors known to influence aspects of older persons' health and independence.

The specific aims of this study were:

1. to assess older persons' benefits and opinions of a PHV service
2. to explore associations between sociodemographic and health-related factors, and older persons' perceived benefits from PHVs.

The PHV service

The municipality introduced the investigated PHV service thirteen years earlier as a population-based health-promotion and preventative strategy. All home-dwelling citizens who were not users of regular home healthcare received an invitation to the PHV service when they reached 75 years old; between 70% and 75% accepted the invitation. Ten experienced registered nurses provided the service and offered annual visits, which was free of charge. The stated aims of the service included promoting older citizens' health, thriving, and abilities to live at home for as long as possible, thereby reducing or delaying their needs for more comprehensive healthcare services (24).

During the first visit, the nurses sought to establish a supportive relationship and assess the older person's health status and life situation. The visiting nurses used a theme guide to ensure that their conversations covered the persons' life histories, physical and mental health statuses, functional abilities, nutrition, home lives, activities, families, and social networks. The nurses used the information to provide personalized support. Depending on situation and preferences, this support might include relaying information about relevant services or activities for older people, providing encouragement to engage in physical activities, or maintaining a healthy diet. It might also include recommendations to undertake a medical consultation; a referral to physiotherapy or another municipal healthcare service; or arranging contact with voluntary associations and services. The visiting nurse might also offer advice about home modifications or provide assistive devices for home safety or improved functioning. The nurse encouraged the users to call if they needed help or advice. The same nurse repeated the visit each year. When a person's functional ability decreased and more

frequent and comprehensive healthcare services were needed, the visitor arranged a transfer to ordinary home healthcare, and the PHV service terminated.

Theoretical understanding of health and health promotion

Health is understood to include pathogenic and salutogenic perspectives and objective and subjective elements (25, 26). This comprehensive view is linked to knowledge about the complexity of individual and socially constructed factors that influence objective and subjective health aspects (27). Many of these factors – or their consequences, may be modified to uphold older persons' health. Health promotion is thus understood as “any activity that improves health status” (27). Within a pathogenic understanding of health as the absence of objective disease, primary prevention aims to prevent disease development by reducing exposure to risk factors, secondary prevention aims to treat the early stages of disease and tertiary prevention aims to reduce the consequences of disease (27).

Health also includes subjective wellbeing, which has physical, emotional, social, and psychological aspects. The various aspects of wellbeing may be promoted regardless of existing disease and illness (27, 28). Promotion of wellbeing may include strategies that facilitate fulfilment of bodily, psychological or social needs related to individual feeling of comfort, safety, pleasure and/or meaning in life (28). Health may also be understood as a resource for coping, positive functioning and a good life. Salutogenic strategies that support a persons' resources, and enhance comprehensibility, manageability and meaningfulness can strengthen a person's sense of coherence and thus promote health (27, 29, 30). These diverse perspectives of health and health promotion informed the development of the questionnaire for the study, and functioned as a background for interpreting and discussing the findings.

METHODS

Study design

This study is part of a comprehensive evaluation of a PHV service in a Norwegian municipality. We applied a quantitative cross-sectional design and conducted a survey of older PHV users during spring 2013. Cross-sectional surveys are appropriate for describing the status of a phenomenon and the associations among phenomena at a fixed point in time (31).

Setting

The study's setting was an urban municipality in Norway with 60,000 inhabitants. The context is the Scandinavian welfare state model, which includes well-developed public healthcare and social services that are provided based on professional judgments of need. All municipalities are obligated by law to offer essential healthcare services to their inhabitants, including health promotion and prevention (32, 33). The investigated municipality was one of the first in Norway to introduce PHVs; the investigated service started as a pilot project in one part of the city in 1999, and the entire municipality was included by 2004.

Participants

To enhance reliability of data, we sought a representable sample of cooperative older persons who had experience from more than one home visit. The sample therefore included all PHV users without dementia who were enrolled in the PHV service before January 1, 2012 (1,830 individuals). Because the service offered annual visits, and duration of follow up might influence the experiences and opinions of the service, we applied a stratified random sampling strategy (31) in which the users were stratified by year of birth. Considerably fewer PHV users

were born before 1929 because these users were included from a single part of the city during the pilot PHV period (1999-2004). When the PHV service was expanded to the entire municipality in 2004, citizens were enrolled as they reached 75 years old, starting with those born in 1929. To ensure a sufficient number of informants from the oldest age groups, an administrative employee in the municipality randomly sampled 20% of the PHV users born between 1929 and 1936 and 30% of the PHV users born in 1928 or earlier, resulting in a list of 393 potential respondents (Figure 1).

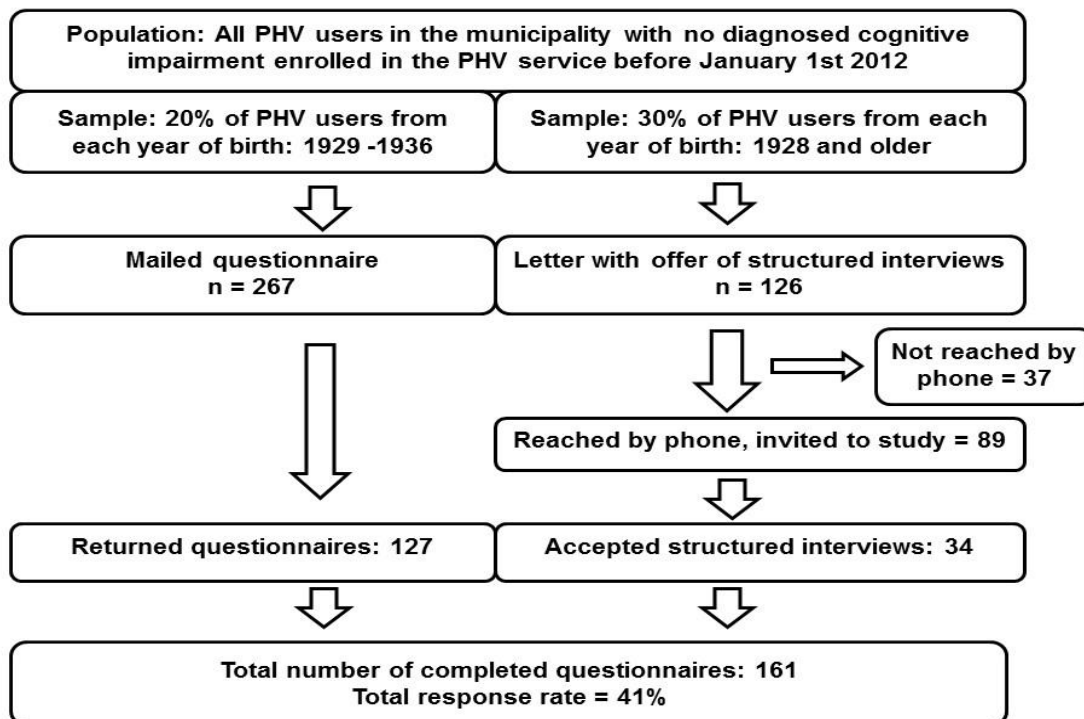


Figure 1. flowchart, inclusion of participants.

Because low response rates among older respondents are common (34-36), we made efforts to facilitate participation and thereby reliability of the data. To increase participant interest in this study, we provided information about the study at a municipal senior meeting

and in the local newspaper prior to recruitment. Potential participants born between 1929 and 1936 received the questionnaire, information about the study and a prepaid postal return envelope. Consent to participate was provided by returning the completed questionnaire. Face-to-face methods are recommended for structured data collection among elderly individuals (35, 36). Therefore, we offered the prospective participants who were born before 1929 a structured interview in their own homes. One week after receiving a letter with information about the study, a research assistant took contact by phone and invited them to participate. The research assistant obtained written informed consent and subsequently interviewed those who accepted. To strengthen the reliability of the data, we instructed the research assistants on how to minimize their influence on the users' responses to the questions. The invited participants completed 161 questionnaires, resulting in a response rate of 41%.

Development of the questionnaire

Because we could not find a relevant validated instrument for measuring older persons' perceived benefits from PHV, we developed a questionnaire. To enhance validity of the data, we made efforts to include relevant questions for the study; We applied our theoretical understanding of health and health promotion, research, expert opinions, the municipality's goals for the PHV service, and older persons' perceived benefits from the service (23). We also customized the questionnaire's design and layout for older people based on theory (37, 38) as well as the opinions of older people. Eight persons, same age group as the respondents, tested the questionnaire's face validity. The questionnaire covered additional areas; however, we only present items that are relevant to the current research.

Measurements

We applied five outcome variables to evaluate the PHV service. Three variables measured how the users considered the previously identified benefits of the PHV: support for feeling of safety (Norwegian: trygghet), for ability to stay at home, and for ability to have a good life (23).

“Trygghet” is a Scandinavian concept, which has no exact English equivalent. We have used the term safety, but the meaning overlaps with security (39). The meaning includes existential, social and structural aspects, and may be described as to be without worries or to have a basic trust in self and the surroundings (39). Qualitative Scandinavian studies have reported that PHVs support “trygghet” among older persons (23, 40, 41). Ability to stay at home covers physical and mental capacity for independent living, while to have a good life relates to thriving and quality of life. The final variables assessed users’ level of overall satisfaction with the service, which is important for adherence to the service, and the perceived importance of the service among older people in the municipality. All of the outcome variables had categorical response alternatives scored using a Likert-type scale. Outcome variables and response alternatives are translated to English in the results section.

The choices related to sociodemographic and health-related items were informed by relevant research on factors known to influence older persons’ objective and subjective health and ability to live independent, and opinions from experts on PHVs and geriatric nursing. Figure 2 displays English translations of these questions.

1. **Gender:** Woman Man
2. **Year of birth:** _____
3. **Number of children:** _____
4. **Education (highest level):**

<input type="checkbox"/> Less than 7 years	<input type="checkbox"/> Folk high-school
<input type="checkbox"/> Primary school	<input type="checkbox"/> Trade School
<input type="checkbox"/> Lower secondary school	<input type="checkbox"/> Vocational education
<input type="checkbox"/> Upper secondary School	<input type="checkbox"/> University or other higher education
<input type="checkbox"/> Other, please describe: _____	
5. **Do you live alone?** Yes No
6. **In general, would you say your physical health is:**
 Excellent Very good Good Fair Poor
7. **In general, would you say your mental health is:**
 Excellent Very good Good Fair Poor
8. **Compared to one year ago, how would you rate your health in general now?**
 Much better Somewhat better About the same Somewhat worse Much worse
9. **How many prescribed drugs do you use:** 0-4 5-9 10 or more
10. **How many people are so close to you that you can count on them if you have serious problems?**
 None 1 or 2 3 - 5 6 or more
11. **How much concern do people show in what you are doing?**
 A lot of concern and interest Some concern and interest Uncertain
 Little concern and interest No concern and interest
12. **How easy can you get practical help from neighbours if you should need it?**
 Very difficult Difficult Possible Easy Very easy
13. **Are you satisfied with your life?** Yes No Do not know
14. **Do you feel needed?** Yes No Do not know
15. **Do you have plans for the future?** Yes No Do not know
16. **Do you have a zest for life?** Yes No Do not know
17. **Are you depressed/sad?** Never/seldom Sometimes Often/always
18. **Do you suffer from loneliness?** Never/seldom Sometimes Often/always

Figure 2. Sociodemographic and health related background questions.

The sociodemographic items included gender, age, education, number of children and living status. We applied items from instruments validated for similar populations. We measured self-rated health status using four questions from the SF-36 (Figure 2; Items 6-9). These items had Likert-scale responses. Social support is known to influence older persons' disease status, wellbeing and ability to live independent (42-44). We measured perceived social support using the Oslo 3 Social Support scale (O3SSS) (42), (Figure 2; Items 10-12). We applied the life-orientation scale (LOS) (45) to measure personal values and dispositional optimism which is shown to be predictors for objective and subjective health and coping in old age (45-47)(Figure 2; Items 13-18). The two latter instruments had categorical/Likert-scale response alternatives with corresponding scoring systems.

Statistical analyses

The data were analysed using SPSS version 24 (IBM, Armonk, NY, USA). Cross tabulations, means, independent-samples t-tests and chi square tests were used to describe the sample in Table 1 (48). Frequency distribution / percentages were used for the evaluation of the main outcome items (48). Prior to the analyses, we dichotomized certain background variables. The variable "number of children" was converted to "children: yes or no". The responses to "education" were transformed into "low" (ten years of education or less) or "high" (more than ten years of education) according to the standard international classification (49). We also computed each respondent's sum score for social support and mean LOS score into the continuous variables "O3SSS score" (42) and "LOS mean" (45).

A simple logistic regression analysis assessed the effect of each background variable on the five outcome variables. All outcome variables were transformed into dichotomized variables prior to the regression analysis (48). The new values of the first outcome (PHV

contributes to feelings of safety) were formed by merging all of the positive responses into the value “yes” (1) and merging those who answered “Do not know” and those who answered negatively into the value “no” (0). Few individuals provided negative responses to the last four outcomes. To ensure that an acceptable number of respondents were classified into each group of the new dichotomized variables, only the extreme positive values were coded as “yes” (1), whereas all of the other values were merged into “no” (0). Variables with p-values of 0.30 or lower in the initial simple logistic regression analyses were included in the regression model for each outcome variable with gender and age. A multiple logistic regression was used to assess the predictive ability of each of these variables when controlling for the other variables in the models (48). We report the results from the simple regression analyses as unadjusted values and the results from the multiple regression analysis as adjusted values in Tables 2-6.

Ethics

The Norwegian Regional Committee for Medical and Health Research Ethics granted ethical approval for this study (ref. 2011/122b). Following the Helsinki Declaration (50), all participants received written information about the study including information about voluntary participation, the right to withdraw from the study, guaranteed confidentiality, and the protection of identity.

RESULTS

Sample characteristics

The sample consisted of 88 men and 73 women with a mean age of 82.1 years (SD = 4.1, range = 77-96 years). Table 1 presents the sample characteristics.

INSERT TABLE 1 ABOUT HERE

No significant differences in gender distribution were observed in the two age groups whether they had children, self-reported health, or social support. Significantly more women than men lived alone, and fewer women than men had a high education level. Significantly fewer individuals in the oldest group reported unchanged or improved health over the last year, and the oldest group was significantly more likely to use five or more prescribed medications.

Older persons' evaluation of the PHV service, and associations between each outcome variable and background variables.

Feelings of safety

The 136 responses to the question “The visits and help from PHV have contributed to your feeling safe” were distributed as follows: No need for help related to this, 78 (57%); not at all, 5 (4%); some contribution, 25 (18%); and considerable contribution, 28 (21%).

The initial simple logistic regression analysis between the dichotomized outcome variable “PHV contributes to my feeling of safety, (no/yes)” and the background variables indicated that age and social support (O3SSS) should be included in the multivariate regression model (Table 2).

INSERT TABLE 2 ABOUT HERE

As Table 2 shows, only age remained significantly associated with feeling safe after controlling for the other variables in the model. The effect of age was significant and strong (p

= 0.01, OR = 1.12, 95% CIs = 1.02-1.23). A 12% increase in the odds of perceiving that PHVs contribute to feeling safe was observed for each year of age.

Ability to stay at home

The 139 responses to the outcome variable “Do you believe that PHVs supported your ability to stay at home?” were distributed as follows: do not know, 35 (25%); not at all, 11 (8%); minor contribution, 8 (5%); to some extent, 26 (19%); and to a large extent, 59 (43%).

The initial simple logistic regression analyses between the dichotomized outcome variable “PHVs supported my ability to stay at home to a large extent (no/yes)” and the background variables indicated that living alone, social support, and physical health should be included in the multivariate logistic regression model (Table 3).

INSERT TABLE 3 ABOUT HERE

Table 3 demonstrates that “living alone” remained significant after controlling for the other variables in the final regression model ($p = 0.02$, OR = 0.33, CIs = 0.13-0.86). People who lived alone were 66% less likely to answer “yes” to the question “PHVs supported my ability to stay at home to a large extent” than those who did not live alone. The variable “physical health” showed a more complex relationship with the outcome variable. Those in the poorest physical health profited most from this aspect of the service. These individuals experienced a 80 % odds reduction for answering “yes” when moving from poor to moderate physical health ($p = 0.05$, 95% CIs = 0.04-0.96); moving from poor to good physical health reduced the odds by 75% ($p = 0.07$, 95% CIs = 0.06-1.11). The other variables were not significantly associated.

Good lives in their own homes

The 141 responses to the third question “Do PHVs enable you to have a good life in your own home?” were distributed as follows: do not know, 34 (24%); not at all, 6 (4%); minor contribution, 9 (6%); to some extent, 29 (21%); and to a large extent, 63 (45%).

The initial simple logistic regression analysis indicated a significant relationship between the outcome variable “PHV enables me to have a good life in my own home to a large extent (no/yes)” and physical health and social support. The variable “children” was also included in the regression model (Table 4).

INSERT TABLE 4 ABOUT HERE

In the final regression model presented in Table 4 only children remained significantly associated with the outcome “PHVs enabled me to have a good life in my own home”, after controlling for the other variables. Having children reduced the odds of answering “contributes to a large extent” by 87% compared with those without children ($p = 0.03$, 95% CIs = 0.02-0.80).

Overall satisfaction with PHVs

The distribution of the 140 responses to the question “Overall, how satisfied are you with the PHV service?” was as follows: do not know, 17 (12%); very dissatisfied, 4 (3%); a little dissatisfied, 3 (3%); satisfied, 31 (22%); and very satisfied: 85 (61%).

Based on the initial simple regression analysis, the final regression model included physical health, change in health over the last year, number of drugs and LOS score (Table 5).

INSERT TABLE 5 ABOUT HERE

After controlling for the other variables in the model, only the LOS score remained significant. Those with higher LOS scores were significantly more satisfied with the PHVs; for each additional point in the LOS mean score, the odds of answering “very satisfied with the PHV service” increased by 325% ($p = 0.02$, 95% CIs = 1.32-13.67).

Importance of PHV among older individuals in the municipality

The distribution of the 144 responses to the last question “Overall, how important is the PHV service for older people in the municipality?” was as follows: do not know, 13 (9%); not important at all, 1 (1%); rather unimportant, 0 (0%); important, 17 (12%); and very important, 113 (79%).

The logistic regression model explored the relationships between the outcome “PHV is a very important service for older people in the municipality (no/yes)” and the variables living alone, education level, mental health, and social support, which were significant in the simple regression analyses (Table 6).

INSERT TABLE 6 ABOUT HERE

We found that living alone significantly and negatively affected the perceived importance of the service after controlling for the other variables in the model; the odds of answering “very important” were 65% lower among those who lived alone than among those not living alone ($p = 0.05$, 95% CIs = 0.12-1.02). With regard to mental health, the total effect on the outcome variable approached significance ($p = 0.07$), and those who reported poor/very

poor or very good mental health more often reported that they perceived the PHV service as very important among older individuals in the municipality. Respondents who reported “average” were significantly less likely (90%) to answer “very important” than those with poor/very poor health ($p = 0.05$).

DISCUSSION

To our knowledge, this study provides the first evaluation of a PHV service in which the users contributed in defining the major outcome measures. These outcomes were related to various subjective health aspects and support for coping as well as to objective health (26-28), and differed from those previously evaluated with regard to PHV studies (6, 9, 11). These benefits illustrate the value of including older persons’ perspectives in PHV evaluations.

Safety is a basic need related to subjective wellbeing (28). Feeling safe is important to older people (51, 52) and Scandinavian qualitative studies have found that PHV may improve feeling of safety among users (17, 23, 40). We found that the majority of the respondents did not need help from PHV related to feelings of safety, but that the importance of PHVs regarding older people’s feelings of safety increases with age, which was not reported previously. This may be because functional decline, anxiety, loneliness and depression increases with age, and these complaints are associated with more insecurity (52, 53). The help and support from PHV nurses may increase vulnerable older persons’ trust in available resources for coping (23), which is related to the concept “manageability” in Antonovsky’s theory on salutogenesis (29). Support for feeling of safety can thus enhance a person’s coping capability, which is essential for older persons’ ability to live independent lives. Additional studies are needed to explore this association.

We found that users with the poorest physical health reported more support for staying at home. Physical health is strongly related to function and thus ability to stay at home (6). To maintain independent living, those experiencing deteriorating physical health need help to compensate for this deterioration (54, 55) and support to reduce further decline. Such help is related to disease preventive strategies (27). Support related to physical activity, assistive devices, and house modifications were among the most frequently reported benefits of PHVs according to a qualitative study in the same context (23). Surprisingly, older people who lived alone reported receiving less support with regard to staying at home than those not living alone. This finding requires further exploration.

Participants without children more often experienced support for living a good life from PHVs than those who had children. Good social relationships and meaningful activities are among the most important aspects of positive functioning and wellbeing among older people (56-58). We surmise that relationships with children and grandchildren contribute to meaningfulness and good lives. Among users who do not have children, however, PHVs might contribute relatively more to living a good life by stimulating social activity and relationships as well as support for meaningful and joyful tasks (23), which represent aspects of emotional and social wellbeing (28).

Users with higher LOS scores were more satisfied with the PHV service. Several studies of older individuals have shown that those with high LOS scores typically relate to the world in a positive way (45, 47, 59). Those with higher LOS scores might therefore have a positive attitude towards PHVs and use the service successfully.

Participants with the poorest mental health found the service to be more important than other respondents. Mental health problems are common in old age (60, 61), and older people in Norway have limited access to relevant treatment (62). A previous qualitative study

reported that the PHV nurses recognised and helped with mental problems through psychosocial support and referrals to other professionals or voluntary visits (23). This help relates to disease prevention as well as promotion of mental well-being (27, 28). This observation might explain the finding and emphasize important aspects of the service. Those living alone perceived the PHV service to be less important than those who did not live alone. This finding may be related to the previously reported less support for living at home. This indicates a potential for improvements of the service for persons living alone, and a need for additional studies to explore the needs among this subgroup.

Each outcome was associated with different background variables, which may indicate that the service met various needs of the users. The findings from previous qualitative studies in the same context (17, 23) demonstrated that older home-dwelling persons' life-situation varies and that nurses are able to provide individualized support- if needed- through a variety of health-promotion strategies (23).

Methodological considerations

Despite our efforts to facilitate participation, the response rate in the study was low, especially in the oldest age group. We have no information about the non-respondents, and we do not know whether the respondents are representative for the population. Low response rate therefore threatens the reliability of the data, and thus the results (31, 63). This must be taken into consideration when reading and interpreting the results.

The low response rate might be due to several factors. We lost approximately 30% of the potential respondents in the older group because they did not answer the phone during study recruitment. The acceptance rate of those we reached by phone was lower than that of the younger group. Older age increases incidence of physical or mental limitations that reduce

individuals' ability or motivation to participate in research (35, 64, 65). Although structured interviews enable those with physical limitations to participate (34, 63), some older individuals might perceive this method as burdensome because they must make an appointment and allow a stranger into their home. Additional strategies such as reminders and distribution of questionnaire by mail to those not reached by telephone might have resulted in more respondents, which would have strengthened the reliability.

Since no relevant validated instruments were available, we developed a questionnaire especially for the study. Use of non-validated questionnaires gives a risk related to validity of data (31). PHV services can be very different in approach, scope and aims (6, 12). To strengthen internal validity and ensure relevant outcome variables, we followed recommendations from mixed methods literature and used main categories from an initial qualitative study as a basis for the outcome variables (66), and eight persons assessed the face validity (31). Despite this, the "do not know" response rates were high with regard to several of the main outcomes. This may be related to unclear questions although this was not detected in the pilot testing. High "do not know" rates may also be explained by a missing response alternative for "not relevant". The proactive nature of the service implies that many of the respondents probably (still) had limited experience with certain outcomes. Two previous qualitative studies among PHV users in the same municipality revealed a great variety with regard to older persons' health and life situation as well as their perceived benefits from PHV (17, 23).

Positive responses to the outcome variables were common, and only a few respondents reported dissatisfaction with certain outcomes. This pattern might have occurred because PHVs are non-compulsory, and probably only those who perceive PHVs as valuable adhere to the service. This skewed distribution provided a methodological challenge with regard to dichotomizing the outcome variables. To merge positive and negative responses into categories

of “agree” and “disagree”, respectively, would lead to uneven category sizes that might threaten the reliability of the logistic regression analyses (67). Thus, we grouped the responses in a restrictive manner, with only the extreme positive value placed in the “yes” category and all other alternatives merged as “no”. This approach results in an excessively strict evaluation.

The tailoring of the outcomes to the specific PHV model restricts the generalizability of the results to comparable PHV services.

CONCLUSIONS

Substantial proportions of respondents reported perceived benefits of PHV and appreciated the service. Each of the outcomes from the PHV service was associated with at least one background variable. Old age, poor mental and physical health and scores on life orientation scale were associated with more perceived benefits from the service, while living alone was associated with less perceived benefits. The results illustrate that a comprehensive PHV service with annual follow up run by experienced nurses may produce valuable benefits that may help older persons to stay independent and thrive in their own homes. There seems to be a potential to improve the service for persons living alone. However, methodological limitations create uncertainty related to the results, in particular to whether these can be generalized to the entire population of PHV receivers. This restrict the possibility to draw conclusions from the study. More and improved studies are therefore needed.

Acknowledgements

We thank all of the study participants from Drammen, Norway, for their time and involvement, and Bjørg Landmark and Lisbeth Bakken in the Research and Development Unit in the municipality of Drammen for facilitating the study. Thanks also to professor Petter Laake at the

University of Oslo, Norway, for supervision on the statistical analyses, and the research assistants Kamilla, Kendra, and Maj Lene from the University College of Southeast Norway, Drammen for their help with the data collection. We also thank the University College of Southeast Norway and the municipality of Drammen, Norway, for funding.

Conflicts of Interest

The authors have declared no conflicts of interest.

Contributions to the manuscript

All listed authors contributed to the study conception and design, analysis and interpretation of data, and critical revisions for important intellectual content. MT carried out the data collection and drafted the manuscript: LF and ITB supervised the study.

Ethical approval

The Norwegian Regional Committee for Medical and Health Research Ethics (ref. 2011/122b) granted ethical approval for this study.

Funding

The authors received financial support for the research of this article from the University College of Southeast Norway and the municipality of Drammen, Norway.

REFERENCES

- 1 World Health Organisation. *Global Health and Aging*.
http://www.who.int/ageing/publications/global_health.pdf
- 2 European Commission [Internet]. *European innovation partnership on active and healthy ageing*. 2016-01-28, http://ec.europa.eu/research/innovation-union/index_en.cfm?section=active-healthy-ageing
- 3 Lofqvist C, Eriksson S, Svensson T, Iwarsson S. First Steps towards Evidence-Based Preventive Home Visits: Experiences Gathered in a Swedish Municipality. *J Aging Res*. 2012; 2012.
- 4 Vass M, Avlund K, Hendriksen C, Philipson L, Riis P. Preventive home visits to older people in Denmark - why, how, by whom, and when? *Z Gerontol Geriatr*. 2007; 40: 209-16.
- 5 Markle-Reid M, Browne G, Weir R, Gafni A, Roberts J, Henderson SR. The Effectiveness and Efficiency of Home-Based Nursing Health Promotion for Older People: A Review of the Literature. *Med Care Res Rev*. 2006; 63: 531-69.
- 6 Beswick AD, Gooberman-Hill R, Smith A, Wylde V, Ebrahim S. Maintaining independence in older people. *Rev Clin Gerontol*. 2010 May 2010; 20: 128-53.
- 7 Stuck A, Kane RL. Whom do preventive home visits help? *J Am Geriatr Soc*. 2008; 56: 561-3.
- 8 Øvretveit J. *Evaluating Health Interventions: Introduction to Evaluation of Health Treatments, Services Policies and Organizational Interventions*. 2010, Buckingham: Open University Press.
- 9 Mayo-Wilson E, Grant S, Burton J, Parsons A, Underhill K, Montgomery P. Preventive Home Visits for Mortality, Morbidity, and Institutionalization in Older Adults: A Systematic Review and Meta-Analysis. *PLoS One*. 2014; 9: e89257.

- 10 Frost H, Haw S, Frank J. Interventions in community settings that prevent or delay disablement in later life: an overview of the evidence. *Qual Ageing Older Adults*. 2012; 13: 212-30.
- 11 Beswick AD, Rees K, Dieppe P, Ayis S, Gooberman-Hill R, Horwood J et al. Complex interventions to improve physical function and maintain independent living in elderly people: a systematic review and meta-analysis. *Lancet*. 2008; 371 725-35.
- 12 Førland O, Skumsnes R. *Forebyggende hjemmebesøk til eldre i Norge. Resultater fra en landsomfattende kommuneundersøkelse. (Preventive home visits to older persons in Norway: results from a national survey)*. 2014, Bergen: Senter for omsorgsforskning Vest
- 13 Vass M, Avlund K, Hendriksen C, Holmberg R, Fiil Nielsen H. *Older people and preventive home visits*. 2006, Svendborg, Denmark Age Forum
- 14 Sahlén K-G. An ounce of prevention is worth a pound of cure: Preventive home visits among healthy seniors. [Doctoral thesis.] 2009 Epidemiology and Public Health Sciences, Department of Public health and clinical Medicine, Umeå University, Sweden, Umeå 65.
- 15 van Kempen JA, Robben SH, Zuidema SU, Olde Rikkert MG, Melis RJ, Schers HJ. Home visits for frail older people: a qualitative study on the needs and preferences of frail older people and their informal caregivers. *Br J Gen Pract*. 2012 Aug; 62: e554-60.
- 16 Behm L, Ivanoff SD, Ziden L. Preventive home visits and health--experiences among very old people. *BMC Public Health*. 2013 Apr 23; 13: 378.
- 17 Tøien M, Heggelund M, Fagerström L. How Do Older Persons Understand the Purpose and Relevance of Preventive Home Visits? A Study of Experiences after a First Visit. In: *Nurs Res Pract*) 2014.
- 18 Clark J. Preventive home visits to elderly people. *BMJ*. 2001; 323: 708-.

- 19 Godfrey M. Prevention: developing a framework for conceptualizing and evaluating outcomes of preventive services for older people. *Health Soc Care Community*. 2001; 9: 89-99.
- 20 McCormack B, Roberts T, Meyer J, Morgan D, Boscart V. Appreciating the 'person' in long-term care. *Int J Older People Nurs*. 2012; 7: 284-94.
- 21 Wyller TB, Pettersen AM. *Forebyggende hjemmebesøk til eldre: Norge - med blikk mot Sverige og Danmark: En kartleggingsundersøkelse. (Preventive home visits to older people: Norway - looking to Sweden and Denmark, a descriptive survey study)*. . 2005, Sem: Aldring og helse.
- 22 Kleinpell RM. Promoting research in clinical practice: strategies for implementing research initiatives. *J Trauma Nurs*. 2009; 16: 114-9.
- 23 Tøien M, Bjørk IT, Fagerström L. Older Users' Perspectives on the Benefits of Preventive Home Visits. *Qual Health Res*. 2015; 25: 700-12.
- 24 Drammen kommune [Internett]. *Forebyggende helseteam for eldre. (Preventive healthcare team for older people in the municipality of Drammen, Norway)*. retrieved 2014-03-28, <http://www.drammen.kommune.no/no/Tjenester/Omsorg-trygd-og-sosiale-tjenester/Hjemmetjenester/Forebyggende-helseteam-for-eldre1/>
- 25 World Health Organization [Internett]. *WHO's definition of Health*. retrieved 1016-01-28, <http://www.who.int/about/definition/en/print.html>
- 26 Fagerström L. Det tredimensjonella kunnskapssynen som epistemologisk grundsyn (The three-dimensional knowledge perspective as epistemological basis. In: *Avancerad Klinisk sjuksköterska (Advanced Practice Nurse)* (Fagerström L ed., 2011 Studentlitteratur AB, Lund 53-68.
- 27 Green J, Tones K, Cross R, Woodall J. *Health promotion: planning and strategies*. 3rd. ed. 2015, Los Angeles: Sage.

- 28 Keyes CLM, Shmotkin D, Ryff CD. Optimizing well-being: The empirical encounter of two traditions. *J Pers Soc Psychol*. 2002; 82: 1007-22.
- 29 Antonovsky A. The salutogenic model as a theory to guide health promotion. *Health promotion Int*. 1996 March 1, 1996; 11: 11-8.
- 30 World Health Organization. *Ottawa charter for health promotion*. retrieved 2016-01-28, <http://www.who.int/healthpromotion/conferences/previous/ottawa/en/index.html>
- 31 Polit DF, Beck CT. *Nursing research: generating and assessing evidence for nursing practice*. 2012, Philadelphia, Pa.: Wolters Kluwer Health.
- 32 Folkehelseloven. *Lov om Folkehelsearbeid, av 2011-06-24 no 29. (Public Health Act)*. <http://lovdata.no>
- 33 Helse- og omsorgstjenesteloven. *Lov om kommunale helse- og omsorgstjenester med mere av 2011-06-24 no 30 (Act on Norwegian Municipal Healthcare Services)*. <http://lovdata.no>
- 34 Edelman SL, Yang MR, Guymon MM, Olson ML. Survey Methods and Response Rates Among Rural Community Dwelling Older Adults. *Nurs Res*. 2013; 62: 286-91.
- 35 Auster J, Janda M. Recruiting older adults to health research studies: A systematic review.) 2009, Oxford, UK 149-51.
- 36 Samelson EJ, Kelsey JL, Kiel DP, Roman AM, Cupples LA, Freeman MB et al. Issues in conducting epidemiologic research among elders: lessons from the MOBILIZE Boston Study. *Am J Epidemiol*. 2008; 168: 1444-51.
- 37 Hartley J. Designing instructional text for older readers: a literature review. *Br J Educ Technol*. 1994; 25: 172-88.
- 38 Jonassen DH, Driscoll MP. *Handbook of Research for Educational Communications and Technology : A Project of the Association for Educational Communications and Technology*. 2nd ed. 2004, Florence, KY.: Routledge.

- 39 Eriksen TH, Kulturell kompleksitet i det nye N. *Trygghet*. 2006, Oslo: Universitetsforl., Det Transnasjonale Norge.
- 40 Behm L, Dahlin Ivanoff S, Zidén L. Preventive home visits and health - experiences among very old people. *BMC Public Health*. 2013; 13: 1-10.
- 41 Sjøbø BA. *Forebyggende hjemmebesøk til eldre. Hvordan eldre erfarer forebyggende hjemmebesøk og hvilken betydning besøket har for dem. [Master Thesis]. (Preventive home visits to older people. How older people experienced preventive home visits and what impact the visits had on them)*. 2014, Oslo: Diakonhjemmet Høgskole.
- 42 Dalgard OS, Dowrick C, Lehtinen V, Vazquez-Barquero JL, Casey P, Wilkinson G et al. Negative life events, social support and gender difference in depression: A multinational community survey with data from the ODIN study. *Soc Psychiatry Psychiatr Epidemiol*. 2006 Jun; 41: 444-51.
- 43 Poulsen T, Siersma VD, Lund R, Christensen U, Vass M, Avlund K. Educational intervention and functional decline among older people: the modifying effects of social capital. *Scand J Public Health*. 2014; 42: 295-303.
- 44 Liu L-F, Su P-F. What factors influence healthy aging? A person-centered approach among older adults in Taiwan. *Geriatrics & gerontology international*. 2016: n/a-n/a.
- 45 Fagerström L. Positive life orientation -- an inner health resource among older people. *Scand J Caring Sci*. 2010; 24: 349-56.
- 46 Olson EA, Fanning JT, Awick EA, Chung HD, McAuley E. Differential Trajectories of Well-Being in Older Adult Women: The Role of Optimism. *Applied Psychology: Health and Well-Being*. 2014; 6: 362-80.
- 47 Eloranta S, Arve S, Lavonius S, Routasalo P, Lehtonen A, Viitanen M et al. Positive life orientation in old age: A 15-year follow-up. *Arch Gerontol Geriatr*. 2012 11//; 55: 586-91.

- 48 Field A. *Discovering statistics using IBM SPSS statistics; and sex and drugs and rock 'n' roll*. 4th ed. 2013, Los Angeles: SAGE.
- 49 UNESCO. *International Standard Classification of Education 1997*. 2006, Geneva: UNESCO Institute for Statistics.
- 50 World Medical Association. *WMA Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects*. retrieved 2016-01-28, <http://www.wma.net/en/30publications/10policies/b3/>
- 51 Petersson I, Lilja M, Borell L. To feel safe in everyday life at home – a study of older adults after home modifications. *Ageing and Society*. 2011; 32: 791-811.
- 52 Fagerström L, Gustafson Y, Jakobsson G, Johansson S, Vartiainen P. Sense of security among people aged 65 and 75: external and inner sources of security. *J Adv Nurs*. 2011; 67: 1305-16.
- 53 Norwegian Institute of Public Health. Folkehelse rapporten [The Status of Public Health in Norway - Report] (Public Health Report 2010: 2.) 2010.
- 54 Chase CA, Mann K, Wasek S, Arbesman M. Systematic Review of the Effect of Home Modification and Fall Prevention Programs on Falls and the Performance of Community-Dwelling Older Adults. *Am J Occup Ther*. 2012; 66: 284-91.
- 55 Baltes MM, Lang FR. Everyday functioning and successful aging: The impact of resources. *Psychol Aging*. 1997; 12: 433-43.
- 56 Keyes CL, Simoes EJ. To flourish or not: positive mental health and all-cause mortality. *Am J Public Health*. 2012 Nov; 102: 2164-72.
- 57 Golden J, Conroy RM, Bruce I, Denihan A, Greene E, Kirby M et al. Loneliness, social support networks, mood and wellbeing in community-dwelling elderly. *Int J Geriatr Psychiatry*. 2009; 24: 694-700.

- 58 Ryff CD. In the eye of the beholder: Views of psychological well-being among middle-aged and older adults. *Psychol Aging*. 1989 Jun; 4: 195-210.
- 59 Tilvis RS, Laitala V, Routasalo P, Strandberg TE, Pitkala KH. Positive life orientation predicts good survival prognosis in old age. *Arch Gerontol Geriatr*. 2012 7//; 55: 133-7.
- 60 Langballe EM, Evensen M. *Eldre i Norge: forekomst av psykiske plager og lidelser. (Mental disorders and suffering among older persons in Norway)*. 2011, Oslo: Folkehelseinstituttet.
- 61 Petersson S, Mathillas J, Wallin K, Olofsson B, Allard P, Gustafson Y. Risk factors for depressive disorders in very old age: a population-based cohort study with a 5-year follow-up. *Soc Psychiatry Psychiatr Epidemiol*. 2014; 49: 831-9.
- 62 Brofoss KE, Larsen F. *Evaluering av Opptappingsplanen for psykisk helse (2001-2009): sluttrapport: Syntese og analyse av evalueringens delprosjekter. (Evaluation of the Escalation-plan for mental health care)*. 2009, Oslo: Norges forskningsråd.
- 63 Bowling A. Mode of questionnaire administration can have serious effects on data quality. *Journal of Public Health*. 2005; 27: 281-91.
- 64 Liljas AEM, Jovicic A, Kharicha K, Iliffe S, Manthorpe J, Goodman C et al. Facilitators and barriers for recruiting and engaging hard-to-reach older people to health promotion interventions and related research: a systematic review. *Lancet*. 2015 2015/11/13; 386: S51.
- 65 Zermansky A, Alldred D, Petty D, Raynor D. Striving to recruit: the difficulties of conducting clinical research on elderly care home residents. *J R Soc Med*. 2007; 100: 258-61.
- 66 Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research*. 2nd ed. 2011, Thousand Oaks, California: Sage Publications.
- 67 Katz MH. *Multivariable Analysis A Practical Guide for Clinicians and Public Health Researchers*. 3rd ed. 2011, Cambridge: Cambridge University Press.

Table 1. Sample Characteristics by Gender and Age /year of birth.

	Women	Men	p	Age / born 76 to 84 / 1929-1936	Age / born > 84 / 1917-1928	p	N
Number (%)	73 (45.3)	88 (54.7)		127 (78.9)	34 (21.1)		161
Age mean (SD)	81.8 (4.22)	82.3 (3.92)	0.403				161
Born 1917-1928 n (%)	15 (20.5)	19 (21.6)	0.872				34
Gender Men n (%)				69 (54.3)	19 (55.9)	0.872	161
Living alone n (%)	40 (56.3)	20 (22.7)	<0.001	44 (35.2)	16 (47.1)	0.206	159
Have children n (%)	59 (90.8)	71 (95.9)	0.216	100(94.3)	30 (90.9)	0.484	139
More than 10 years of education n (%)	51 (69.9)	78 (88.6)	0.003	98 (77.2)	31 (91.2)	0.069	161
Good / very good physical health n (%)	45 (64.3)	46 (53.5)	0.174	72 (59.0)	19 (55.9)	0.872	156
Good / very good mental health n (%)	49 (71.0)	69 (79.3)	0.231	91 (74.6)	27 (79.4)	0.562	156
Unchanged / improved health last year n (%)	52 (73.2)	57 (64.8)	0.253	94 (75.2)	15 (44.1)	0.001	159
Four or less drugs n (%)	50 (70.4)	61 (70.9)	0.945	93 (75.6)	18 (52.9)	0.010	157
O3SSS score (SD)	9.30 (2.24)	9.31 (2.16)	0.973	9.14 (2.12)	9.82 (2.33)	0.114	140
LOS mean (SD)	2.53 (0.40)	2.70 (0.33)	0.003	2.63 (0.39)	2.61 (0.30)	0.791	159

Differences between gender and age and the various variables are assessed using the Chi Square test for categorical variables and using the independent sample T-test for continuous variables.

O3SSS = Oslo 3 Social Support Scale

Table 2. The Association Between the Outcome Variable “PHV Contributed to My Feeling Safe (no/yes)” and the Background Variables. Logistic Regression Model, Unadjusted and Adjusted Values

	Unadjusted values				Adjusted values			
	p	OR	95% CIs (OR)		p	OR	95% CIs (OR)	
			Lower	Upper			Lower	Upper
Gender: 0 = women, 1 = men	.54	0.81	0.40	1.61	.47	0.75	0.35	1.64
Age	.01	1.13	1.04	1.24	.01	1.12	1.02	1.23
O3SSS score	.08	0.18	0.98	1.42	.12	1.16	0.96	1.40
LOS mean score	.43	1.46	0.58	3.67				
Children: 0 = no, 1 = yes	.95	1.05	0.24	4.64	-	-	-	-
Living alone: 0 = no, 1 = yes	.77	0.90	0.44	1.83	-	-	-	-
Education: 0 = 10 years and less, 1 = 11 and more years	.85	1.08	0.47	2.52	-	-	-	-
Physical health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	.90				-	-	-	-
Physical health: 2 compared with 1	.48	0.66	0.21	2.09	-	-	-	-
Physical health: 3 compared with 1	.59	0.74	0.25	2.19	-	-	-	-
Physical health: 4 compared with 1	.54	0.66	0.17	2.49	-	-	-	-
Mental health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	.58				-	-	-	-
Mental health: 2 compared with 1	.28	2.67	0.45	15.96	-	-	-	-
Mental health: 3 compared with 1	.23	2.73	0.54	13.84	-	-	-	-
Mental health: 4 compared with 1	.16	3.33	0.61	18.14	-	-	-	-
Change in health over last year: 0 = declined health, 1 = unchanged or improved health	.77	1.12	0.54	2.30	-	-	-	-
Drugs: total effect 1 = ten and more drugs, 2 = 5-9 drugs, 3 = four or less drugs	.93				-	-	-	-
Drugs: 2 compared with 1	.94	1.07	0.16	7.22	-	-	-	-
Drugs: 3 compared with 1	.93	0.92	0.15	5.79	-	-	-	-

Final Model: N = 119, Cox & Snell R Square = .082, Nagelkerke R Square = .111

Hosmer and Lemeshow Test for Goodness of Fit: $\chi^2 (8) = 5.096$, p = 0.747

OR = odds ratio, CIs = confidence intervals

Table 3. The Association Between the Outcome Variable: “PHV Contributed to a large extent to My Ability to Stay at Home (no/yes)” and the Background Variables. Logistic Regression Model, Unadjusted and Adjusted Values

	Unadjusted values				Adjusted values			
	p	OR	95 % CIs (OR)		p	OR	95 % CIs (OR)	
			Lower	Upper			Lower	Upper
Gender: 0 = women, 1 = men	.56	0.82	0.42	1.60	.18	0.56	0.24	1.32
Age	.57	1.02	0.95	1.11	.45	1.04	0.95	1.13
O3SSS score	.09	1.17	0.98	1.39	.39	1.09	0.89	1.34
LOS mean score	.32	1.60	0.64	4.00	.39	1.74	0.50	6.13
Children: 0 = no, 1 = yes	.42	0.57	0.14	2.22	-	-	-	-
Living alone: 0 = no, 1 = yes	.05	0.48	0.23	0.99	.02	0.33	0.13	0.86
Education: 0 = 10 years and less, 1 = 11 and more years	.96	0.98	0.42	2.26	-	-	-	-
Physical health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	.30				.19			
Physical health: 2 compared with 1	.79	0.83	0.21	3.25	.05	0.20	0.04	0.96
Physical health: 3 compared with 1	.13	0.42	0.14	1.27	.07	0.25	0.06	1.11
Physical health: 4 compared with 1	.13	0.44	0.15	1.26	.33	0.42	0.07	2.44
Mental health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	.67				-	-	-	-
Mental health: 2 compared with 1	.93	0.93	0.21	4.18				
Mental health: 3 compared with 1	.54	1.50	0.41	5.45				
Mental health: 4 compared with 1	.43	1.75	0.43	7.08				
Change in health over last year: 0 = declined health, 1 = unchanged or improved health	.77	1.12	0.53	2.34	-	-	-	-
Drugs: total effect 1 = ten and more drugs, 2 = 5-9 drugs, 3 = four or less drugs	.60				-	-	-	-
Drugs: 2 compared with 1	.34	3.05	0.31	29.97				
Drugs: 3 compared with 1	.31	3.15	0.34	29.31				

Final Model: N=123, Cox & Snell R Square = .088, Nagelkerke R Square = .119

Hosmer and Lemeshow Test for Goodness of Fit: $\chi^2 (8) = 10,763$ p = .215

OR = odds ratio, CIs = confidence intervals

Table 4. The Association Between the Outcome Variable “PHV Provided Considerably Support for a Good Life in My Own Home (no/yes)”, and the Background Variables. Logistic Regression Model, Unadjusted and Adjusted values

	Unadjusted values				Adjusted values			
	p	OR	95 % CIs (OR)		p	OR	95 % CIs (OR)	
			Lower	Upper			Lower	Upper
Gender: 0 = women, 1 = men	.63	0.85	0.44	1.66	.58	1.31	0.51	3.34
Age	.40	1.04	0.96	1.12	.27	1.06	0.96	1.18
O3SSS score	.02	1.23	1.04	1.47	.16	1.18	0.94	1.48
LOS mean score	.04	2.89	1.07	7.91	.11	3.27	0.77	13.94
Children: 0 = no, 1 = yes	.28	0.44	0.10	1.95	.03	0.13	0.02	0.80
Living alone: 0 = no, 1 = yes	.79	0.91	0.45	1.82	-	-	-	-
Education: 0 = 10 years and less, 1 = 11 and more years	.53	0.77	0.33	1.75	-	-	-	-
Physical health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	.05				.14			
Physical health: 2 compared with 1	.44	1.64	0.47	5.7	.62	1.56	0.27	8.93
Physical health: 3 compared with 1	.79	1.18	0.36	3.88	.66	1.49	0.26	8.53
Physical health: 4 compared with 1	.03	5.00	1.20	20.92	.08	6.19	0.81	47.33
Mental health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	.67				-	-	-	-
Mental health: 2 compared with 1	.93	.93	0.21	4.18				
Mental health: 3 compared with 1	.54	1.50	0.41	5.45				
Mental health: 4 compared with 1	.43	1.75	0.43	7.08				
Change in health over last year: 0 = declined health, 1 = unchanged or improved health	.91	1.04	0.50	2.17	-	-	-	-

Final Model: N = 108, Cox & Snell R Square = .179, Nagelkerke R Square = .241

Hosmer and Lemeshow Test for Goodness of Fit: $\chi^2 (8) = 9.800$ p = 0.279

OR = odds ratio, CIs = confidence intervals

Table 5. The Association Between the Outcome Variable “Very Satisfied with PHV (no/yes)” and the Background Variables. Logistic Regression Model, Unadjusted and Adjusted values

	Unadjusted values				Adjusted values			
	p	OR	95 % CIs (OR)		p	OR	95 % CIs (OR)	
			Lower	Upper			Lower	Upper
Gender: 0 = women, 1 = men	.17	0.61	0.31	1.23	.38	0.72	0.34	1.51
Age	.22	1.06	0.97	1.23	.09	1.09	0.99	1.20
OSSS score	.32	1.09	0.92	1.30	-	-	-	-
Children: 0 = no, 1 = yes	.71	1.30	0.03	5.10	-			
Living alone: 0 = no, 1 = yes	.45	0.76	0.38	1.55	-			
Education: 0 = 10 years and less, 1 = 11 and more years	.39	1.44	0.63	3.33	-			
Physical health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	.09				.27			
Physical health: 2 compared with 1	.55	0.70	0.21	2.27	.49	0.64	0.18	2.28
Physical health: 3 compared with 1	.59	0.73	0.24	2.28	.40	0.57	0.16	2.09
Physical health: 4 compared with 1	.13	3.40	0.69	16.69	.43	2.05	0.34	12.38
Mental health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	.38							
Mental health: 2 compared with 1	.90	0.92	0.23	3.70				
Mental health: 3 compared with 1	.52	1.50	0.44	5.12				
Mental health: 4 compared with 1	.23	2.33	0.59	9.23				
Change in health over last year: 0 = declined health, 1 = unchanged or improved health	.28	1.49	0.72	3.09	.11	1.61	0.90	2.88
Drugs: 0 = 5 and more drugs, 1 = four or less drugs	.20	0.61	0.28	1.31	.73	0.89	0.44	1.79

Final Model: N = 135, Cox & Snell R Square = .089, Nagelkerke R Square = .121

Hosmer and Lemeshow Test for goodness of fit: $\chi^2 (8) = 6.355$ p = .50

OR = odds ratio, CIs = confidence intervals

Table 6. The Association Between the Outcome Variable “The PHV is very important for older people in the municipality (no/yes)” and Background Variables: Logistic Regression Model, Unadjusted and Adjusted Values

	Unadjusted values				Adjusted values			
	p	OR	95% CIs (OR)		p	OR	95% CIs (OR)	
			Lower	Upper			Lower	Upper
Gender: 0 = women, 1 = men	0.93	1.04	0.47	2.31	0.79	0.86	0.30	2.51
Age	0.88	0.99	0.90	1.09	0.68	0.98	0.87	1.09
OSSS score	0.06	1.21	0.99	1.48	0.08	1.22	0.97	1.52
LOS mean score	0.57	1.33	0.49	3.62				
Children: 0 = no, 1 = yes	0.43	1.80	0.42	7.71				
Living alone: 0 = no, 1 = yes	0.02	0.36	0.18	0.89	0.05	0.35	0.12	1.02
Education: 0 = 10 years and less, 1 = 11 and more years	0.13	2.02	0.81	5.07	0.54	1.45	0.44	4.76
Physical health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	0.55							
Physical health: 2 compared with 1	0.15	0.31	0.06	1.56				
Physical health: 3 compared with 1	0.28	0.42	0.09	2.05				
Physical health: 4 compared with 1	1.00	23082123.56	0.00	.				
Mental health: total effect 1 = poor / very poor, 2 = average, 3 = good, 4 = very good	0.02				0.07			
Mental health: 2 compared with 1	0.06	0.12	0.01	1.07	0.05	0.10	0.01	1.03
Mental health: 3 compared with 1	0.28	0.31	0.04	2.61	0.12	0.18	0.02	1.60
Mental health: 4 compared with 1	0.94	0.91	0.09	9.69	0.80	0.72	0.06	9.33
Change in health over last year: 0 = declined health, 1 = unchanged or improved health	0.54	0.76	0.31	1.86				
Drugs: 0 = 5 and more drugs, 1 = four or less drugs	1.00	1.00	0.41	2.41				

Final Model: N = 127, Cox & Snell R² = 0.139, Nagelkerke R² = 0.219, Hosmer and Lemeshow test for goodness of fit: $\chi^2(8) = 4.957$, p = 0.762

OR = odds ratio, CIs = confidence intervals