Abstract

Background: Frequent attendance is largely a temporary phenomenon but only few previous studies have made a distinction between long-term frequent attenders (FAs) and short-term FAs.

Aims: The aim of this study is to compare the characteristics of middle-aged long-term FAs and short-term FAs.

Methods: Data from a large Northern Finland Birth Cohort 1966 study's (NFBC1966) 46-year follow-up study (performed in 2012, N=10**,**321) were used. The participants (n=4,390) had used public primary healthcare (PPHC) services at least once during 2013–2016 according to Finnish national register data on outpatient visits. A FA was considered a patient who had used PPHC services ≥8 times during one year. A long-term FA: a patient who was a FA in at least three years during 2013–2016. A short-term FA: a patient who was a FA in one or two years in 2013–2016. Cross-tabulation, Pearson´s Chi-Square test, Mann-Whitney U test, and univariate and multivariate binary logistic regression analyses were used.

Results: Of the 4,390 participants, 132 (3.0%) were long-term FAs, 645 (14.7%) were short-term FAs, and 3,613 (82.3%) were nonFAs. During 2013–2016, long-term FAs accounted for 34.8% of PPHC visits, while short-term FAs accounted 15.4%. Compared to short-term FAs, depression and high income (preventive attribute) were associated with long-term FAs. Female gender and managing usual activities were associated with short-term FAs. Poor self-reported health was associated with both long-term FAs and short-term FAs but increased the risk of being a long-term FA over three times compared to short-term FAs.

Conclusions: Middle-aged long-term FAs and short-term FAs have distinct characteristics, namely, depression and high income differentiate long-term FAs from short-term FAs. Poor self-reported health was associated with long-term FAs in particular. In order to identify FAs with prolonged service needs and to develop far-reaching interventions, the focus of research should be on long-term FAs.

Key words: long-term frequent attender, population-based cohort, healthcare utilisation, middle aged

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Introduction

Frequent attenders (FAs) use healthcare services more frequently than the average population. According to previous literature reviews, top 10% of patients account for 30–50% of consultations in general practice (1), and 55% of total healthcare costs (2). If the need for both social and healthcare services is considered, the top 10% of service users account for 81% of municipal social and healthcare costs (3). In addition to straining the healthcare system, frequent attendance burdens FAs themselves, as their need for services leads to follow-up visits and higher treatment expenses (4). FAs are also often afflicted by conditions that effect their everyday life (5). Previous studies have found that numerous attributes are associated with frequent attendance, for example, somatization, having multiple chronic health conditions, psychological problems, poor (self-reported) health, dissatisfaction with the current life situation, and socioeconomic situation (4,6). Usually there is not only one clear attribute that explains frequent attendance. Instead, it is the combination of several attributes (1,4,6). In addition to individual attributes, frequent attendance may be affected by how the healthcare services are arranged, and how the healthcare system is able respond to FAs' distinctive needs (5).

Increasing interest in the topic has led to systematic reviews of FAs (1,4,6), several interventions targeted at FAs, as well as systematic reviews of the effectiveness of interventions (7,8,9). Although the interventions may not have achieved clear results regarding reduction in healthcare use (7,9), the interventions may have indirectly affected FAs through improved quality of life and general health perceptions (7). The assessment of the effectiveness of interventions may have been affected by the fact that some FAs do not have

longitudinal need for services, and thus they may return to "normal" attendance rates even without an intervention. In fact, even though previous studies have provided important information on frequent attendance, the existing literature has usually not considered whether frequent attendance is a short-term or long-term phenomenon. Instead, the definition for frequent attendance has usually based on consultation rates during one year (10). Approximately 40% of FAs continue to be FAs in the following year (11). Long-term FAs only represent 3.6% of the entire patient population and 18.9% of the FA population, yet they account for 12.5–15.5% of all general practice consultations (12). When cost-effective arrangement of healthcare services is considered, interventions targeted at long-term FAs can result in more effective results. However, to our knowledge, only two interventions have been directed at long-term FAs (13,14). Because previous studies have focused on frequent attendance in general and several interventions have been developed based on these results, there is a need for research where a clear distinction is made between long-term FAs and short-terms FAs, and whether their attributes and service needs differ.

As is the case for frequent attendance in general, there are several definitions for also long-term FAs. Similarly to frequent attendance, the definitions for long-term FAs are based on the number of healthcare visits (four to eight visits) (15,16) or hospital admissions (four or more) (17) during a specific time period, percentual share of the patient population (18) or the costs caused (19). A few studies have used age and sex stratification when using percentage-based definition for long-term FAs (top 10% of the patient population) in order to avoid selection bias (without stratification there would be more female and elderly patients) (10). When defining long-term FAs, studies have usually considered visits to specific healthcare sectors (e.g. emergency department) (15), visits to specific healthcare professionals (mainly

physicians) (10,12) or visits to multiple healthcare professionals (e.g. nurses and psychologists) (18). Billings and Raven (20) categorised long-term FAs into four sub-groups: three or more, or five or more visits in a year during three continuous years, and three or more, or five or more visits in a year during five continuous years. Use of different definitions hampers the comparison of study results. Currently, there is limited knowledge about the attributes which distinguish long-term FAs from short-term FAs (12,16). Studies dealing with this distinction have been conducted in Australian (12) and Finnish primary healthcare (16). In Finland, primary healthcare services are arranged through three sectors: public primary healthcare (PPHC), occupational healthcare and private healthcare services. PPHC services are provided by municipalities and are publicly funded, which enables access to care for all citizens. Occupational healthcare services are aimed at working population, organised by employers, and provided usually by municipalities.

Compared to short-term FAs, only female gender and chronic health conditions have been consistently found to be associated with long-term FAs in primary healthcare (12,16). Other identified factors were related to health behaviors, mental health and medication use (12,16). Due to lack of knowledge on which attributes are associated with long-term FAs, it is difficult to say which attributes found to be associated with FAs in general are associated with specifically long-term FAs. The present study aimed to fill this gap in knowledge by comparing the characteristics of long-term FAs and short-term FAs.

Material and methods

The study population was a subsample of the Northern Finland Birth Cohort 1966's (NFBC1966) 46-year follow-up study, conducted in 2012. NFBC1966 includes children born in two Northern Finland provinces in 1966 (n=12,058). Since pregnancy, the follow-up data has been collected through clinical examinations and questionnaires when the cohort members were aged 1, 14, 31, and 46 years old. The 46-year follow-up study included a target population of 10,321. This study included the following eligibility criteria: 1) information of the participant's use of PPHC services was available from the national register; 2) The participant provided two written informed consents: "my information collected in this study can be used in non-identifiable form for research purposes"; and "national register information regarding me can be incorporated to information collected in this and previous studies in non-identifiable form for research purposes"; 3) The participant had used PPHC services at least once during 2013–2016. A total of 4,390 participants were included in this study. (Figure 1).

Information was collected from the cohort members through self-administered questionnaires, which included questions about, for example, health and lifestyle, work, and economy. In this study, information from the 46-year follow-up study was used to determine the characteristics of study participants. Information on the use of PPHC services was merged with NFBC1966 data to define FAs. PPHC service use statistics were based on Finnish national register data on outpatient visits in the Care Registers for Social Welfare and Health care, which are administered by the National Institute for Health and Welfare. The data contains information

on Finnish population's use of PPHC services, where, for example, visits to physician, nurse, and physiotherapist were considered.

Definition for a frequent attender

A FA was defined as a patient who had used PPHC services at least eight times during one year (16). A long-term FA was defined as a patient who was a FA in at least three out of four follow-up years (2013–2016) (16). A short-term FA was defined as a patient who was a FA in one or two of the follow-up years. A nonFA was defined as a patient who had used PPHC services at least once during 2013–2016 but was not a FA in any of the four follow-up years.

Measures

The following independent variables were considered: gender; marital status; education; employment status; equivalent income; self-reported health; satisfaction with current life situation; health-related quality of life; and chronic health conditions. Gross household income was divided by the number of consumption units in the household (both of which were self-reported) to determine equivalent income (21). High income was defined as 60% above, and low income as 60% below, the median income (22). Health-related quality of life was assessed using the validated 15D instrument. During data analysis, the dimensions of 15D were evaluated both separately and as a total value (15D score) (23). The missing value procedure was used to replace up to three missing values (24). The questionnaire in the 46-year follow-up study inquired about the prevalence of several health conditions using the

following question: ‘Have you ever had any following symptoms, sicknesses or injuries verified or treated by a doctor?’. Only chronic health conditions belonging to the International Classification of Diseases (ICD-10) were included in the variable concerning multiple chronic health conditions. In total, 56 chronic health conditions, e.g. asthma, cancer, and diabetes, were considered. Chronic health conditions were categorized into three categories: none, one, or two or more chronic health conditions. Depression and alcohol problem were handled separately.

Statistical methods

The data were analyzed with IBM SPSS Statistics version 24. The level of statistical significance was $p<0.05$. Cross-tabulation with Pearson’s Chi-Square test was used to identify the background factors that distinguish long-term FAs from other participant groups. Mean values and standard deviations were calculated for the total 15D score, as well as each separate dimension, and Mann-Whitney U test was used to compare the 15D scores of different participant groups. Univariate and multivariate binary logistic regression analyses were performed to determine which characteristics are associated with long-term FAs. Four different models were developed: 1) nonFAs vs short-term FAs; 2) nonFAs vs long-term FAs; 3) nonFAs vs anyFAs (long-term FAs and short-term FAs combined); 4) short-term FAs vs long-term FAs. The first three models applied nonFAs as the reference group, while the fourth model used short-term FAs as the reference group. The multivariate binary logistic regression analyses applied forward selection. Given the number of independent variables tested, only the variables, which were significantly associated with FAs (either long-term FAs, short-term FAs or anyFAs) in the univariate analyses, were included in the multivariate analyses.

Ethical approval

The 46-year follow-up study was approved by the Northern Ostrobothnia Ethical Committee (94/2011). This study followed responsible conduct of research as outlined by the Finnish Advisory Board on Research Integrity (25) and World Medical Association Declaration of Helsinki (26).

R**esults**

Of the 4,390 participants, 132 (3.0%) were long-term FAs, 645 (14.7%) were short-term FAs, and 3,613 (82.3%) were nonFAs. Thus, long-term FAs accounted for 17.0% of FAs. During the four-year follow-up period, long-term FAs, short-term FAs and nonFAs accounted for 34.8% (10,995), 15.4% (4,863), and 49.7% (15,700) of the PPHC visits (n=31,558), respectively. Relative to short-term FAs, long-term FAs were more likely to be unmarried or divorced, have lower education status, show lower income, be unsatisfied with their current life situation, report poor health, and have multiple chronic health conditions (Table I). Relative to nonFAs, short-term FAs and long-term FAs were more likely to be female, unsatisfied with their current life situation, have poorer perceptions of their health, and have multiple chronic health conditions.

Short-term FAs and long-term FAs showed slightly higher mean 15D scored than nonFAs (Table II). The 15D dimensions with the lowest mean scores for every FA groups were sleeping, discomfort and symptoms, and vitality. Interestingly, nonFAs showed the lowest

mean score in these three dimensions, while long-term FAs showed the highest score. Mann-Whitney U test results indicated a statistically significant difference between short-term FAs and long-term FAs in mobility (p=0.026), and between nonFAs and short-term FAs in usual activities (p=0.008).

The factors marital status (being divorced or unmarried), self-reported health (poor and decent), dissatisfaction with the current life situation, and depression showed significant differences between groups in all four of the univariate binary logistic regression analysis models (Table III). In model 1, female gender, basic education, usual activities, alcohol problem, and multiple chronic health conditions were associated with short-term FAs. In model 2, high income, alcohol problem and multiple chronic health conditions were associated with long-term FAs. In model 3, female gender, basic education, low income, 15D, usual activities, discomfort and symptoms, alcohol problem, and multiple chronic health conditions were associated with being anyFA. Model 4 showed that high income and mobility were more likely to be associated with long-term FAs than short-term FAs.

The multivariate binary logistic regression analysis indicated that female gender, poor self-reported health, and usual activities (a dimension of 15D) differentiate short-term FAs from nonFAs, while being divorced, poor self-reported health, and depression differentiate long-term FAs from nonFAs (Table IV). Female gender, being divorced, poor self-reported health, usual activities, alcohol problem, and multiple chronic health conditions differentiated anyFAs from nonFAs. High income (preventive attribute), poor self-reported health, and depression differentiated long-term FAs from short-term FAs. Thus, only poor self-reported health seemed to be associated with all of the FA groups. Poor self-reported health increased

the risk of being a long-term FA over three times compared to short-term FAs, and over nine times compared to nonFAs. Alcohol problem and multiple chronic health conditions were associated with anyFAs, but not with either short-term FAs or long-term FAs. Female gender and usual activities were associated with anyFAs and short-term FAs. Possible confounding variables were also included in the models. For example, the simultaneous inclusion of usual activities and depression in Model 1 indicated that depression no longer significantly differentiated short-term FAs from nonFAs.

Discussion

This study provided novel results of long-term FAs' characteristics and differentiated long-term FAs from short-term FAs. Although long-term FAs comprised only 3% of the entire patient population, they accounted for approximately 35% of all healthcare visits during four years, whereas short-term FAs (15% of the patient population) accounted for 15% of visits. Long-term FAs were differentiated from short-term FAs through characteristics of depression and high income (preventive attribute). Relative to nonFAs, long-term FAs were also more likely to be divorced. In contrast, female gender and usual activities were typical characteristics of short-term FAs. Poor self-reported health was the only attribute associated with all of the FA groups but compared to nonFAs and short-term FAs, poor-self-reported health seemed to be associated with long-term FAs in particular.

The most influential attribute identified across all FA groups was poor self-reported health. The attribute of poor self-reported health was particularly significant for long-term FAs. This

finding agrees with what has previously been reported in studies of frequent attendance in general (4,6). However, the presented results do not mirror what was found in the few studies that have compared long-term FAs and short-term FAs. A univariate logistic regression analysis performed by Pymont and Butterworth (12) found that participants who self-reported poor health were ten times more likely to be long-term FAs than short-term FAs; however, this trend was not detected in a subsequent multivariate logistic regression analysis. However, in multivariate logistic regression analysis they found that worrying about one's health seemed to differentiate long-term FAs from short-term FAs.

Poor self-reported health being associated with long-term FAs in particular may be explained by the fact that the need for services has prolonged. Reasons for attendance may result from, for example, somatisation, psychological problems and poor self-reported health (4,6). In their concept analysis of frequent attendance, Kivelä et al. (4) highlighted how the symptoms that FAs report negatively influence their health status and quality of life. Similarly, psychosocial distress has been found to be common among FAs (27). The feeling of not being able to cope with one's situation is another central reason for consultations (5). Before consulting FAs seem to wait until their health problems get worse or they can no longer bear with the pain (5,28). On the other hand, reasons for attendance are related to not knowing when attending care is necessary, and thus FAs attend to be on the safe side (29). Having chronic health conditions may be considered as an objectively detectable reason for several healthcare visits. Chronic health conditions (either multiple or individual chronic conditions) have been identified as characteristics of FAs in general (4,6). Interestingly, in line with this result, having multiple chronic health conditions did not seem to be associated (in multivariate binary logistic regression analysis) with short-term FAs or long-term FAs but only with

anyFAs. However, 78% of long-term FAs and 72% of short-term FAs had multiple chronic health conditions. To our knowledge, previous studies have not examined the association between multiple chronic health conditions and long-term FAs. However, individual chronic health conditions, such as diabetes, hypertension, and respiratory diseases are associated with long-term FAs (19).

In addition to poor self-reported health, depression was associated with long-term FAs. Although multiple chronic health conditions were not associated with long-term FAs in the present study, depression differentiated long-term FAs from both nonFAs and short-term FAs, which is in line with previous results (12). However, it should be noted that Pymont and Butterworth (12) used The Goldberg Anxiety and Depression scale (30) to assess FA experiences of depression, while in this study the participants answered whether a physician had diagnosed depression. Depression did not seem to be associated with short-term FAs or anyFAs in the performed analyses, which suggests that depression is a distinct attribute of long-term FAs. According to a recent review, psychosocial distress is significantly associated with frequent attendance (27). However, six of the seven studies were cross-sectional, with only one adopting a longitudinal design, leaving it unclear whether psychosocial distress is a longitudinal predictor of frequent attendance. The results of this study strengthen the theory that psychosocial distress might be a longitudinal attribute of frequent attendance.

Regarding social problems, which are often related to income level (4), in this study being divorced seemed to differentiate long-term FAs from nonFAs. High income (preventive attribute) seemed to differentiate long-term FAs from short-term FAs. Pymont and Butterworth (12) did not find long-term FAs and short-term FAs to be differentiated by

socioeconomic characteristics; more specifically, being outside of the work life and socioeconomic difficulties were only associated with anyFAs. Findings regarding income level may not have as strong relevance in the context of Finnish PPHC as they have in other countries. Low income reduces access to care in some countries such as the United States (2). Low socioeconomic status has previously been associated with frequent attendance in primary care, but for example in Denmark, socioeconomic factors do not have an impact on the use of primary healthcare (4). Similarly, in Finland PPHC services are publicly funded, which enables access to care for all citizens despite of their income level. Finnish PPHC services are mainly used by patients with lower socioeconomic status (31), whereas working population uses mainly occupational healthcare services.

Previous research which mirror the methodological choices of the present study (i.e. long-term FA definition) shows that long-term FAs comprise a relatively small part of the patient population (12,18,19). In this study, 3.0% of the patient population were considered as long-term FAs, which is in line with previous studies where 2.9% (19) and 3.6% (12) of patients were identified as long-term FAs. However, previous studies have reported that long-term FAs account for 16% (12) to 21% (19) of healthcare visits over several years, while the long-term FAs in this study contributed to over one-third of all healthcare visits. This may be due to the fact that this study considered any visit to PPHC (e.g. visits to physicians and nurses) to represent a healthcare visit, whereas previously reported results were only based on visits to general practice (12) or outpatient and inpatient visits (19). Reho et al. (18) identified 0.9% of patients as long-term FAs. They took into account visits to physicians, physiotherapists, nurses and psychologists, which lead to 40.4 annual visits. FAs usually need multi-professional healthcare services (32), which is why wide-ranging service needs should be

taken into account when defining (long-term) frequent attendance. Interventions with multi-professional teamwork (8,33) and case management (where the care is planned in collaboration and different available service options are assessed in order to identify individual needs and to gain cost-effective outcomes) (34) have positive effects on FAs. Thus, long-term FAs' service needs should be identified from a multi-professional perspective to provide service plans based on their various needs. In Finland and Sweden, for example, in addition to physicians, nurses and other healthcare professionals have an important role in PPHC. Alongside physicians, nurses are the first contact for patients.

The results indicate that comparing separate FA groups can be valuable for identifying characteristics specific to long-term FAs and short-term FAs. In fact, only poor self-reported health was associated with all of the FA groups. Other attributes were specifically associated with either short-term FAs, long-term FAs or anyFAs. Most studies that have focused on frequent attendance (2,4) examined FAs without considering whether participants have long- or short-term needs for healthcare services. For example, although multiple chronic health conditions and alcohol problem were associated with anyFAs, neither of these characteristics was significantly associated either short-term FAs or long-term FAs in this study.

Managing usual activities and female gender were associated with short-term FAs but not with long-term FAs. The 15D instrument was used to assess health-related quality of life. A previous study conducted in Finnish healthcare setting (16) did not find the 15D score to be associated with long-term FAs, which is in line with the presented results. However, the present study examined separate dimensions in addition to the total 15D score. Only managing usual activities was associated with anyFAs and short-term FAs, but not with long-

term FAs. In contrast, previous research has found that the health of long-term FAs' limits moderate activities (12). Previous reviews have linked female gender with frequent attendance (4,6). In contrast to previous studies, which have differentiated long-term FAs from short-term FAs through female gender (12,16), female gender was only associated with short-term FAs – but not with long-term FAs – in this study.

Strengths and limitations

An important strength of this study is that it is based on a large Finnish population-based birth cohort study that provided information on 4,390 individuals. However, as this study included only Finnish participants and was conducted in the context of Finnish healthcare, the presented results may not be directly generalizable to other healthcare settings. Another strength is that, to the best of our knowledge, only two previous studies conducted in a comparable context have identified attributes specific to long-term FAs compared to short-term FAs.

The fact that participants self-reported information is a clear limitation, particularly regarding the prevalence of chronic health conditions. However, participant perceptions of health and quality of life are factors which require self-assessment. Another limitation is that differing definitions for long-term FAs complicate the comparison of results with what has previously been reported. We used the number of annual visits to define FAs, and defined long-term FAs as patients who were FAs for at least three years to consider frequent attendance as a longitudinal phenomenon. Frequent attendance was previously shown to vary greatly, even on

a monthly basis, i.e. a patient may be a FA one month but not the next (35). Thus, defining long-term FAs as patients who have been FAs for two years includes the possibility for chance occurrence: frequent visits may take place at the end of the first year and at the beginning of the following year. The present study included cohort members who had used PPHC services at least once during the four follow-up years. Thus, we did not determine participants' FA status during each of the follow-up years, which may have led to potential selection bias.

Conclusions

The results of this study provide important and novel research-based knowledge on how long-term FAs differ from short-term FAs and the general FA population. Furthermore, the results strengthen previous findings, which emphasize that long-term FAs and short-term FAs should be examined as separate groups due to their unique attributes. The presented results demonstrated that although long-term FAs comprise a small proportion of the FA population, they account for more than one-third of healthcare visits. Depression and high income (preventive attribute) were associated with long-term FAs, while female gender and managing usual activities were associated with short-term FAs. Poor self-reported health was the only attribute associated with both long-term FAs and short-term FAs. The results of this study somewhat differed from what has been reported in studies that applied a similar long-term FA definition and concentrated on differentiating short-term FAs and long-term FAs. Thus, future research should apply methodologies which allow findings pertaining to long-term FAs to be compared with previous studies and generalized. The unique attributes described for long-term FAs and short-term FAs indicate a need to acknowledge patient-centredness when

individual service plans are made and interventions are developed for specific FA groups. Due to long-term need for healthcare services, long-term FAs have gained various experiences of the functionality of healthcare services, and can thus provide experiential knowledge of how the care received is able to respond to patients' needs.

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Table I. Characteristics of long-term frequent attenders (FAs), short-term FAs, and nonFAs.

	Long-term FA n=132 n (%)	Short-term FA n=645 n (%)	NonFA n=3613 n (%)	Significance p-value
Gender				
Male	52 (39.4)	234 (36.3)	1612 (44.6)	<0.001
Female	80 (60.6)	411 (63.7)	2001 (55.4)	
Marital status				<0.001
Married/Cohabiting	74 (56.1)	432 (70.0)	2694 (74.6)	
Unmarried	22 (16.7)	75 (11.6)	386 (10.7)	
Divorced	23 (17.4)	94 (14.6)	358 (10.0)	
Education				0.007
Tertiary	24 (18.2)	144 (22.3)	865 (23.9)	
Secondary	76 (57.6)	393 (60.9)	2314 (64.0)	
Basic	16 (12.1)	57 (8.8)	229 (6.3)	
Employment status				0.567
Employed[1]	56 (42.4)	320 (49.6)	1701 (47.1)	
Unemployed	1 (0.8)	20 (3.1)	115 (3.2)	
Disability pension	2 (1.5)	10 (1.6)	58 (1.6)	
Others outside of workforce[2]	4 (3.0)	21 (3.3)	78 (2.2)	
Income				<0.001
Low	23 (17.4)	79 (12.2)	366 (10.1)	
Middle	81 (61.4)	337 (52.2)	2021 (55.9)	
High	8 (6.1)	97 (15.0)	637 (17.6)	
Satisfaction with the current life situation				<0.001
Satisfied	86 (65.2)	498 (77.2)	3107 (86.0)	
Unsatisfied	31 (23.5)	96 (14.9)	308 (8.5)	
Cannot tell	2 (1.5)	6 (0.9)	30 (0.8)	
Self-reported health				<0.001
Good	30 (22.7)	283 (43.9)	2217 (61.4)	
Decent	59 (44.7)	246 (38.1)	1094 (30.3)	
Poor	27 (20.5)	71 (11.0)	123 (3.4)	
Number of chronic health conditions[3,4]				<0.001
0	7 (5.3)	51 (7.9)	508 (14.1)	
1	12 (9.1)	98 (15.2)	806 (22.3)	
≥2	103 (78.0)	464 (71.9)	2168 (60.0)	

Cross-tabulation and Pearson´s Chi-Squared test. [1]part-time or full-time work, [2]e.g. students, individuals on parental leave, [3]chronic health conditions, which belong to International Classification of Diseases (ICD-10), [4]The most prevalent chronic health conditions were: hypertension (long-term FA: 49 (37.1), short-term FA: 165 (25.6), nonFA: 733 (20.3)); back disorder (long-term FA: 40 (30.3), short-term FA: 175 (27.1), nonFA: 778 (21.5)); migraine (long-term FA: 34 (25.8), short-term FA: 147 (22.8), nonFA: 681 (18.8)); other skin disease than hand eczema or psoriasis (long-term FA: 24 (18.2), short-term FA: 93 (14.4), nonFA: 411 (11.4)); anaemia (long-term FA: 21 (15.9), short-term FA: 86 (13.3), nonFA; 434 (12.0)).

Table II. 15D profiles of long-term frequent attenders (FAs), short-term FAs, and nonFAs.

Health-related quality of life	**Long-term FA**	**Short-term FA**	**nonFA**
Mobility	0.95±SD 0.14*[1]	0.98±SD 0.08	0.98±SD 0.09
Vision	0.95±SD 0.11	0.94±SD 0.11	0.93±SD 0.12
Hearing	0.96±SD 0.09	0.97±SD 0.09	0.96±SD 0.10
Breathing	0.92±SD 0.18	0.94±SD 0.13	0.94±SD 0.14
Sleeping	0.86±SD 0.17	0.84±SD 0.17	0.83±SD 0.17
Eating	1.00±SD 0.00	1.00±SD 0.00	1.00±SD 0.02
Speech	1.00±SD 0.04	0.99±SD 0.06	0.98±SD 0.08
Excretion	0.91±SD 0.18	0.92±SD 0.15	0.90±SD 0.17
Usual activities	0.99±SD 0.06	0.98±SD 0.08**[2]	0.96±SD 0.13
Mental function	0.93±SD 0.14	0.92±SD 0.16	0.92±SD 0.15
Discomfort and symptoms	0.82±SD 0.18	0.81±SD 0.17	0.79±SD 0.20
Depression	0.95±SD 0.11	0.93±SD 0.13	0.92±SD 0.14
Distress	0.94±SD 0.12	0.91±SD 0.15	0.91±SD 0.15
Vitality	0.90±SD 0.13	0.90±SD 0.14	0.88±SD 0.15
Sex activity	0.96±SD 0.11	0.93±SD 0.14	0.94±SD 0.15
Mean 15D score	0.94±SD 0.06	0.93±SD 0.06	0.92±SD 0.07

Mean and standard deviation. The Mann Whitney U test was used to test statistical significance, and the results are statistically non-significant ($p<0.05$) unless otherwise indicated. ***<0.001, **<0.01, *<0.05. [1]compared to short-term FAs, [2]compared to nonFAs

Table III. Independent variables associated with short-term FAs, long-term FAs, and anyFAs (long-term FAs and short-term FAs combined).

Independent variable	NonFA vs **short-term FA** OR (95% CI)	NonFA vs **long-term FA** OR (95% CI)	NonFA vs **anyFA** OR (95% CI)	Short-term FA vs **long-term FA** OR (95% CI)
Gender				
Male	1	1	1	1
Female	1.42 (1.19–1.68)***	1.24 (0.87–1.77) ns	1.38 (1.18–1.62)***	0.88 (0.60–1.29) ns
Marital status				
Married/Cohabiting	1	1	1	1
Unmarried	1.21 (0.93–1.58) ns	2.08 (1.27–3.38) **	1.34 (1.05–1.70)*	1.71 (1.00–2.93)*
Divorced	1.64 (1.28–2.10)***	2.34 (1.45–3.78)**	1.74 (1.38–2.19)***	1.43 (0.85–2.40) ns
Education				
Tertiary	0.98 (0.80–1.21) ns	0.85 (0.53–1.35) ns	0.96 (0.79–1.16) ns	0.86 (0.52–1.42) ns
Secondary	1	1	1	1
Basic	1.47 (1.08–2.00)*	2.13 (1.22–3.71)**	1.57 (1.19–2.08)**	1.45 (0.79–2.66) ns
Employment status				
Employed[1]	1	1	1	1
Unemployed	0.92 (0.57–1.51) ns	0.26 (0.04–1.93) ns	0.83 (0.51–1.33) ns	0.29 (0.04–2.17) ns
Disability pension	0.92 (0.46–1.81) ns	1.05 (0.25–4.40) ns	0.94 (0.50–1.76) ns	1.14 (0.24–5.36) ns
Others outside of workforce[2]	1.43 (0.87–2.35) ns	1.56 (0.56–4.41) ns	1.45 (0.91–2.31) ns	1.09 (0.36–3.29) ns
Income				
Low	1.29 (0.99–1.69) ns	1.57 (0.97–2.52) ns	1.35 (1.06–1.72)*	1.21 (0.72–2.05) ns
Middle	1	1	1	1
High	0.91 (0.72–1.16) ns	0.31 (0.15–0.65)**	0.80 (0.63–1.01) ns	0.34 (0.16–0.73)**
Self-reported health				
Good	1	1	1	1
Decent	1.76 (1.46–2.12)***	3.99 (2.55–6.22)***	1.98 (1.66–2.35)***	2.26 (1.41–3.63)**
Poor	4.52 (3.29–6.21)***	16.22 (9.35–28.14)***	5.64 (4.22–7.55)***	3.59 (2.01–6.42)***
Satisfaction with the current life situation				
Satisfied	1	1	1	1
Unsatisfied	1.95 (1.52–2.49)***	3.64 (2.37–5.57)***	2.29 (1.75–2.75)***	1.87 (1.17–2.98)**
Cannot tell	1.25 (0.52–3.01) ns	2.41 (0.57–10.24) ns	1.42 (0.65–3.11) ns	1.93 (0.38–9.72) ns
15D	6.45 (0.99–42.18) ns	10.77 (0.14–821.75) ns	6.96 (1.20–40.45)*	1.68 (0.016–173.45) ns
Mobility	2.61 (0.55–12.42) ns	0.12 (0.02–1.02) ns	1.27 (0.34–4.70) ns	0.054 (0.00 – 0.69)*
Vision	2.17 (0.72–6.54) ns	4.10 (0.30–55.31) ns	2.38 (0.85–6.69) ns	1.89 (0.12–29.75) ns
Hearing	2.19 (0.58–8.21) ns	0.80 (0.06–10.63) ns	1.85 (0.55–6.22) ns	0.34 (0.02–6.45) ns
Breathing	1.37 (0.54–3.42) ns	0.38 (0.07–2.10) ns	1.09 (0.47–2.50) ns	0.28 (0.04–1.84) ns
Sleeping	1.61 (0.78–3.30) ns	2.84 (0.53–15.27)	1.74 (0.89–3.41) ns	1.70 (0.30–9.54)

		ns		ns
Eating	-	-	-	-
Speech	2.40 (0.41–14.07) ns	54.15 (0.08–37957.19) ns	3.27 (0.58–18.37) ns	29.25 (0.03–28763.17) ns
Excretion	2.12 (0.98–4.57) ns	1.39 (0.27–7.10) ns	1.98 (0.97–4.03) ns	0.65 (0.11–3.92) ns
Usual activities	6.87 (1.77–26.66)**	19.72 (0.44–882.87) ns	7.88 (2.16–28.70)**	3.28 (0.05–201.10) ns
Mental function	0.93 (0.43–2.03) ns	1.34 (0.22–8.25) ns	0.98 (0.47–2.04) ns	1.43 (0.21–9.58) ns
Discomfort and symptoms	1.76 (0.93–3.32) ns	2.91 (0.69–12.32) ns	1.90 (1.05–3.45)*	1.90 (0.35–10.33) ns
Depression	1.40 (0.56–3.50) ns	6.77 (0.58–79.23) ns	1.71 (0.72–4.09) ns	4.68 (0.36–60.33) ns
Distress	0.81 (0.37–1.78) ns	5.88 (0.66–52.35) ns	1.03 (0.49–2.20) ns	7.33 (0.75–72.04) ns
Vitality	1.93 (0.84–4.41) ns	1.99 (0.31–12.75) ns	1.94 (0.89–4.21) ns	1.04 (0.13–8.06) ns
Sex activity	1.06 (0.47–2.36) ns	5.08 (0.46–56.39) ns	1.27 (0.59–2.75) ns	5.35 (0.41–69.78) ns
Depression	1.97 (1.57–2.47)***	4.28 (2.89–6.33)***	2.28 (1.86–2.80)***	2.17 (1.42–3.33)***
Alcohol problem	2.45 (1.67–3.59)***	3.94 (2.10–7.40)***	2.69 (1.90–3.81)***	1.61 (0.82–3.17) ns
Number of chronic health conditions[3]				
0	1	1	1	1
1	1.21 (0.85–1.73) ns	1.08 (0.42–2.76) ns	1.20 (0.85–1.67) ns	0.89 (0.33–2.41) ns
≥ 2	2.13 (1.57–2.89)***	3.45 (1.59–7.46)**	2.29 (1.72–3.05)***	1.62 (0.71–3.67) ns

Univariate binary logistic regression analyses. The odds ratios (OR) and 95% confidence intervals (CI) are presented. ***<0.001, **<0.01, *<0.05, ns>0.05, [1]part-time or full-time work, [2]e.g. students, individuals on parental leave, [3]chronic health conditions which belong to International Classification of Diseases (ICD-10). Frequent attender groups under interest are bolded. nonFA: non frequent attender.

Table IV. Independent variables associated with short-term FAs, long-term FAs, and any FAs.

Independent variable	NonFA vs **short-term FA**	NonFA vs **long-term FA**	NonFA vs **anyFA**	Short-term FA vs **long-term FA**
Gender				
Male	1		1	
Female	1.74 (1.31–2.30)***		1.67 (1.28–2.18)***	
Marital status				
Married/Cohabiting	1	1	1	
Unmarried	0.93 (0.62–1.41) ns	1.33 (0.78–2.26) ns	0.84 (0.56–1.25) ns	
Divorced	1.43 (0.99 – 2.07) ns	1.98 (1.17 – 3.33)*	1.47 (1.03–2.10)*	
Equivalent income				
Low				1.00 (0.57–1.76) ns
Middle				1
High				0.40 (0.17–0.98)*
Self-reported health				
Good	1	1	1	1
Decent	1.67 (1.26–2.21)***	3.21 (2.02–5.08)***	1.59 (1.22–2.08)**	2.12 (1.28–3.51)**
Poor	3.38 (2.04–5.62)***	9.78 (5.38–17.76)***	3.35 (2.09–5.36)***	3.29 (1.71–6.32)***
Usual activities	4.65 (1.13–19.12)*		5.09 (1.31–19.76)*	
Depression	1.26 (0.88–1.81) ns	2.335 (1.52–3.59)***	1.34 (0.96–1.87) ns	1.78 (1.10–2.89)*
Alcohol problem	1.84 (0.93–3.66) ns		1.92 (1.02–3.62)*	
Multiple chronic health conditions				
0		1	1	
1		0.95 (0.35–2.62) ns	1.36 (0.79–2.35) ns	
≥ 2[1]		2.32 (0.99–5.42) ns	2.15 (1.33–3.47)**	

Multivariate binary logistic regression analyses. The odds ratios (OR) and 95% confidence intervals (CI) are presented. ***<0.001, **<0.01, *<0.05, ns ≥ 0.05, [1]Chronic health conditions, which belong to International Classification of Diseases (ICD-10). Frequent attender groups under interest are bolded. nonFA: non frequent attender.