Original Article

Characterstics of Middle-Aged Frequent Attenders and their Use of Helthcare Professionals´ Services within Public Primary, Occupational and Private Healthcare: A Population-Based Cohort Study in Northern Finland

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Abstract

Background: The characteristics of frequent attenders have been studied extensively; however, there is a scarce literature on the frequent attenders´ use of different healthcare sectors´ and professionals´ services.
Aims: To characterise middle-aged frequent attenders (FAs) of the public primary healthcare (PPHC), and to examine their use of healthcare professionals´ services across PPHC, occupational (OHC), and private healthcare (PHC).
Methodology: The data used is part of the Northern Finland Birth Cohort 1966´s 46-year follow-up study collected in 2012, during which 5484 cohort members answered to a questionnaire about use of healthcare services. A FA was defined as a patient who had made ≥ 8 PPHC visits within the previous year. Cross-tabulation, and binary logistic regression analysis were used.
Results: FAs (n=519, 9.5%) primarily used PPHC services, whereas their use of PHC and OHC services was much lower (45.5%, 9.5%, and 10.2% of all consultations, respectively). Within the PPHC, FAs used a wide variety of services provided by different healthcare professionals, particularly those offered by physiotherapists (198 FAs used 81.8% of services) and psychologists (85 FAs used 88.5% of services). Unemployment, drawing a disability pension, ex-smoking, poor or decent self-reported health, having ≥ 2 chronic health conditions ($p \leq 0.001$), having one chronic health condition ($p \leq 0.01$), female gender, dissatisfaction with the current life situation, abstinence from alcohol, heavy drinking, and BMI ≥ 30 ($p < 0.05$) seemed to be associated with frequent attendance.
Conclusions: FAs have complex needs and seem to use primarily different healthcare professionals´ services within public primary healthcare, whereas their use of private and occupational healthcare services is noticeably lower. Frequent attenders´ service use includes a wide variety of healthcare providers´ services in addition to physicians´ services.

Key Words: primary healthcare, middle aged, healthcare utilization, frequent attender, population-based cohort

Introduction

Frequent attenders (FAs) have been found to have physical, psychological, and social problems (LaCalle, Rabin 2010, Vedsted, Christensen 2005). Of social factors, for example, low employment status is associated with frequent attendance (Jørgensen, Andersen et al. 2016, Vedsted, Olesen 2005). FAs themselves have evaluated their health as poor (Kivelä, Elo et al. 2018, LaCalle, Rabin 2010), and have been found to suffer from multiple chronic health conditions (Salisbury, Johnson et al. 2011). Frequent attendance causes expenditure for both the society and FAs themselves, leading to follow-ups and social disadvantages (Kivelä, Elo et al. 2018). Although FAs only comprise 4.5–8% of the patient population (LaCalle, Rabin 2010), they account for one-fifth to one-half of all healthcare visits (LaCalle, Rabin 2010, Vedsted, Christensen 2005). In Finland, FAs have been found to cause 81% of the total costs of health and social services (Leskelä, Komssi et al. 2013).

In Finland, the primary healthcare services provided in public primary healthcare (PPHC), occupational healthcare (OHC), and private healthcare (PHC) constitute the main routes for accessing specialised healthcare. Legislation requires municipalities to arrange health services for their citizens. These services are provided mainly in PPHC centres, and are financed by municipal taxation and state subsidies. Patients are charged for a small amount for consultations (Ministry of Social Affairs and Health, 2013). Medical treatment for the employed population is mainly provided by OHC (Ministry of Social Affairs and Health 2013). OHC is free of charge for the employees. Employers are obligated to offer preventive OHC services for their employees, which may be outsourced to PPHC centres, PHC sector, or other service providers. The Social Insurance Institution of Finland reimburses the employers a portion of OHC costs (Ministry of Social Affairs and Health, 2013). Public healthcare services are supplemented by private healthcare services, which are provided by non-governmental organisations and enterprises. The Social Insurance Institution of Finland reimburses a portion of PHC costs for the clients. Health insurance is statutory covering the whole population (Ministry of Social Affairs and Health, 2013). As the services provided within PPHC are financed by municipal taxation and state subsidies, information about the FAs of PPHC is important from the economic perspective.

While the characteristics of FAs have been widely studied in the literature, only a few studies have examined FAs´ use of different services provided by various healthcare sectors and healthcare professionals (Byrne, Murphy et al. 2003, Hansagi, Olsson et al. 2001, Huang, Weng et al. 2008, Kaattari, Tiirinki et al. 2015). Also, many of the previous studies have taken into account only visits to physicians. FAs of PPHC physicians´ services have been reported to also use other healthcare professionals´ services within the PPHC system (Kaattari, Tiirinki et al. 2015). The aim of the current study was to characterise FAs of PPHC and to examine their use of different healthcare professionals´ services across PPHC, OHC, and PHC sectors. The study seeks to answer the following research questions: Which characteristics are associated with middle-aged FAs of PPHC? To what extent do FAs of PPHC use different healthcare professionals´ services within PPHC, OHC, and PHC? To what extent do FAs of PPHC use PPHC, OHC, and PHC services?

Methods

Setting: Cross-sectional data from a 46-year follow-up study of the Northern Finland Birth Cohort (NFBC1966) was used. NFBC1966 included children born in the provinces of Oulu and Lapland in 1966 (n=12 058 born alive, containing 96% of all births in the area during 1966) (Rantakallio 1988). 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. At the 46th -year follow-up in 2012, self-report questionnaires, which included questions about health, socioeconomic factors, and use of healthcare services, were administered. The target population was 10,321 people, of which 6825 (66.4%) replied. To the questionnaire, which included questions pertaining to use of healthcare services, 54.7% replied. Of the cohort members who were invited to participate in the 46th -year follow-up study, the respondents were more often women, had higher education, were more often employed, and were more often married or cohabited ($p \leq 0.001$). The 46th year follow-up study was approved by the Northern Ostrobothnia Ethical Committee (94/2011). The participating cohort members provided a written informed consent.

Participants: In this study, in order to define FAs, we used data from subjects who had answered to the question about use of PPHC services, reducing the number of participants to 5484 (53.1%). Subjects were considered as FAs if they had used PPHC services at least eight times during the previous year (Hirsikangas, Kanste et al. 2018, Keto, Ventola et al. 2017, Koskela, Ryynanen et al. 2010). Visits to physician, public health nurse, psychologist, physiotherapist, dentist, and other healthcare professional were considered as PPHC visits (Keto, Ventola et al. 2017, Lankila, Näyhä et al. 2016). In order to identify potential risk factors for frequent attendance, and to calculate the number of visits to healthcare sectors, self-reported information from questionnaires was used. OHC visits included visits to physicians, public health nurses, psychologists, and physiotherapists. PHC visits included visits to physicians, dentists, and physiotherapists.

Data analysis: The data were analyzed by IBM SPSS Statistics version 24. The level of statistical significance was set at $p<0.05$. To examine the characteristics associated with frequent attendance, cross-tabulation with Pearson's Chi-Square test, and multivariate binary logistic regression analysis were used. Non-FAs were used as the reference group for FAs.

To determine potential risk factors underlying frequent attendance, and in order to build the models for multivariate binary logistic regression analysis, Andersen's behavioral model of health services use was applied, supplemented by parts of the third phase of the model, which recognises personal health practices (Andersen 1995). Since the development of the initial model in 1968, three revisions have been carried out. Andersen's initial model accounted for predisposing factors, enabling resources and need factors. The second phase of the model (1970s) included the influence of the organisation of the healthcare services, as well as consumer satisfaction. As the data used did not provide adequate information about these aspects, the second phase of the model was not used. The third phase of the model (1980s–1990s) recognises the influence of available/used health services on the maintenance and improvement of health status, as well as the effect of external environment on both health service use and personal health practices (Andersen 1995). As the current data did not provide full information on all of the aforementioned variables of the third phase of the model, information solely pertaining to personal health practices was assessed.

The models for multivariate binary logistics regression analysis were build as follows: predisposing factors (Model 1), enabling resources (Model 2) personal health practices (Model 3), and need factors (Model 4). The following predisposing characteristics were included: female gender, marital status, education, employment status, and satisfaction with the current life situation. Regarding enabling resources, equivalent income was included. The gross income of the household was divided by the number of consumption units in the household. The equivalent income was categorised using the European Commission's guidelines (European Comission 2018): high income was defined as 60% above, and low income as 60% below, the median income (Diaz, Gimeno-Feliu et al. 2014).) Of personal health practices, body mass index (BMI), smoking, and alcohol use were included in the analysis. BMI was measured in a clinical examination as part of the 46-year follow-up study. The formation of both the smoking (Keto, Ventola et al. 2017) and the alcohol use (Vladimirov, Niemelä et al. 2015) variable was based on previous research. Of need factors, self-reported health and chronic health conditions (38 in total) were included. Chronic health conditions were self-reported by answering the following question: 'Have you ever had any following symptoms, sicknesses or injuries verified or treated by a doctor?'. Hosmer-Lemeshow test was used in order to examine the goodness of fit for logistic regression models. Non-FAs were used as the reference group for FAs

In order to determine and compare how many of the study subjects´ had used PPHC, OHC, and PHC services, frequencies, percentages, Pearson´s Chi-Square test, and medians for the visits were applied. Mann-Whitney test was used to examine and compare p-values for the medians. Lower and upper quartiles were used alongside the medians. These estimates were solely examined for those study subjects who had used the service in question at least once during the previous year, as the inclusion of all the study subjects would have biased the results. To examine FAs' use of PPHC, OHC, and PHC visits, their share of total consultations was calculated using frequencies and percentages.

Results

Characteristics of FAs

A total of 519 (9.5%) research subjects were considered as FAs of PPHC. The characteristics of FAs and non-FAs are presented in Table 1. As compared to non-FAs, within FAs there were more females, unmarried, and divorced. FAs tended to have a lower educational status, be more often unemployed or draw a disability pension, and have a lower income level. FAs were more frequently ex or current smokers, and abstainers from alcohol. FAs appeared to report more frequently dissatisfaction with their current life situation, and evaluated their health as poor.

Table 1: The characteristics of middle-aged frequent attenders and non-frequent attenders. Pearson´s Chi-Square test. The information was self-reported.

Independent variable	Frequent attenders n=519 n (%)	Non-frequent attenders n=4965 n (%)	All n=5484 n (%)	p-value
Female gender	324 (62.4)	2808 (56.6)	3132 (57.1)	0.010
Marital status				<0.001
Married/cohabiting	344 (66.3)	3823 (77.0)	4167 (76.0)	
Unmarried	69 (13.3)	527 (10.6)	596 (10.9)	
Divorced	74 (14.3)	447 (9.0)	521 (9.5)	
Highest education				<0.001
Tertiary	80 (15.4)	1431 (28.8)	1511 (27.6)	
Secondary	348 (67.1)	3087 (62.2)	3435 (62.6)	
Basic	55 (10.6)	242 (4.9)	297 (5.4)	
Employment status				<0.001
Full-time work	291 (56.1)	3933 (79.2)	4224 (77.0)	
Part-time work	45 (8.7)	356 (7.2)	401 (7.3)	
Unemployed	63 (12.1)	234 (4.7)	297 (5.4)	
Disability pension	44 (8.5)	76 (1.5)	120 (2.2)	
Others	51 (9.8)	210 (4.2)	261 (4.8)	
Income				<0.001
Low income	97 (18.7)	492 (9.9)	589 (10.7)	
Middle income	278 (53.6)	2857 (57.5)	3135 (57.2)	
High income	55 (10.6)	1009 (20.3)	1064 (19.4)	
Satisfaction with the current life situation				<0.001
Satisfied	388 (74.8)	4420 (89.0)	4808 (87.7)	
Unsatisfied	97 (18.7)	355 (7.2)	452 (8.2)	
Can´t tell	3 (0.5)	33 (0.7)	36 (0.7)	
Self-reported health				<0.001
Good	219 (42.2)	3376 (70.0)	3595 (65.6)	

Decent	210 (40.5)	1306 (26.3)	1516 (27.6)	
Poor	63 (12.1)	118 (2.4)	181 (3.3)	
Smoking				<0.001
Non-smokers	203 (39.1)	2638 (53.1)	2841 (51.8)	
Ex-smokers	54 (10.4)	286 (5.8)	340 (6.2)	
Quitters	10 (1.9)	75 (1.5)	85 (1.5)	
Current smokers	121 (23.3)	796 (16.0)	917 (16.7)	
Alcohol use				<0.001
Binge drinkers	21 (4.0)	125 (2.5)	146 (2.7)	
Heavy drinkers	34 (6.6)	445 (9.0)	479 (8.7)	
Abstainers	80 (15.4)	430 (8.7)	510 (9.3)	
Others	358 (69.0)	3822 (77.0)	4180 (76.2)	
BMI				
< 30	351 (67.6)	3770 (75.9)	4085 (74.5)	<0.001
≥ 30	162 (31.2)	909 (18.3)	1071 (19.5)	
Number of chronic health conditions				<0.001
0	94 (18.1)	1940 (39.1)	2034 (37.1)	
1	133 (25.6)	1475 (29.7)	1608 (29.3)	
≥2	271 (52.2)	1431 (28.8)	1702 (31.0)	

To identify the characteristics with the strongest association with frequent attendance, a multivariate binary logistic regression analysis was carried out (Table 2). As demonstrated in Model 1, all predisposing factors except for unmarried status seemed to associate with frequent attendance. Adding income to the model (Model 2), showed low income not having statistical significance in the model. In Model 3, the previously significant associations between frequent attendance and basic education, part-time work, and high income became non-significant. Of personal health practices, ex-smoking, heavy drinking, abstinence from alcohol, and BMI ≥ 30 seemed to be associated with frequent attendance. After adding need factors to the final model (Model 4), being divorced and tertiary education lost their statistical significance in the final model, where, in total 13 characteristics seemed to be associated with frequent attendance: unemployment, drawing a disability pension, ex-smoking, poor or decent self-reported health, having one or more chronic health conditions, female gender, dissatisfaction with the current life situation, abstinence from alcohol, heavy drinking, and BMI ≥ 30. The significance of Hosmer-Lemeshow test was over 0.05 in every model, and thus supported the models.

FAs´ use of healthcare services

FAs' and non-FAs' (those who had used the services in question at least once during the previous year) use of PPHC, OHC, and PHC services are presented in Table 3. In comparison to non-FAs, FAs appeared to use a wider range of PPHC services (p<0.001). As compared to non-FAs, FAs' use of both physicians´ and dentists´ services was two-fold, and for public health nurses´ services greater than three-fold within PPHC. According to the medians for visits to PPHC, relative to non-FAs, FAs use of physicians´, physiotherapists´, and psychologists´ services was four-fold, the use of dentists´ services was three-fold, and the use of public health nurses´ services was two-fold. Within OHC, only use of physicians´ and public health nurses´ services, and merely use of dentists´ services within PHC, were statistically significant (p<0.001). Relative to non-FAs, FAs´ use of

public health nurses´ services within OHC was two-fold, while non-FAs use of dentists´ services within PHC was two-fold in comparison to that of FAs. Moreover, non-FAs also used physicians´ services within OHC more frequently as compared to FAs.

Table 2 Multivariate binary logistic regression analysis of the associations between the characteristics and frequent attenders. The models are constructed according to predisposing factors (Model 1), enabling resources (Model 2), personal health practices (Model 3), and need factors (Model 4). The odds ratios and 95% confidence intervals are presented. Non-frequent attenders were used as the reference group. Apart from body mass index, which was measured in a clinical examination as part of the 46-year follow-up study, the information was self-reported.

Independent variable	Model 1[a] odds ratio (95% confidence interval)	Model 2[b] odds ratio (95% confidence interval	Model 3[c] odds ratio (95% confidence interval	Model 4[d] odds ratio (95% confidence interval
Gender				
Male	1.0	1.0	1.0	1.0
Female	1.35 (1.10 to 1.66)**	1.33 (1.07 to 1.65)*	1.35 (1.04 to 1.76)*	1.33 (1.02 to 1.74)*
Marital status				
Married/cohabiting	1.0	1.0	1.0	1.0
Unmarried	1.01 (0.74 to 1.37)	0.94 (0.68 to 1.32)	0.77 (0.51 to 1.15)	0.77 (0.52 to 1.15)
Divorced	1.59 (1.19 to 2.12)**	1.45 (1.07 to 1.99)*	1.51 (1.04 to 2.20)*	1.38 (0.94 to 2.03)
Education				
Secondary	1.0	1.0	1.0	1.0
Tertiary	0.54 (0.42 to 0.70)***	0.56 (0.42 to 0.73)***	0.70 (0.51 to 0.96)*	0.73 (0.53 to 1.02)
Basic	1.63 (1.15 to 2.29)**	1.59 (1.09 to 2.32)*	1.55 (0.99 to 2.44)	1.41 (0.89 to 2.23)
Employment status				
Full-time work	1.0	1.0	1.0	1.0
Part-time work	1.49 (1.05 to 2.11)*	1.48 (1.03 to 2.14)*	1.27 (0.80 to 2.02)	1.17 (0.73 to 1.89)
Unemployed	2.88 (2.08 to 3.98)***	2.71 (1.91 to 3.86)***	3.14 (2.08 to 4.72)***	2.79 (1.84 to 4.23)***
Disability pension	5.94 (3.86 to 9.15)***	6.07 (3.77 to 9.77)***	6.84 (3.95 to 11.84)***	4.81 (2.73 to 8.49)***
Others	2.89 (2.02 to 4.14)***	2.33 (1.53 to 3.53)***	2.12 (1.27 to 3.53)**	1.85 (1.09 to 3.12)*
Satisfaction with the current life situation				
Satisfied	1.0	1.0	1.0	1.0
Unsatisfied	2.10 (1.59 to 2.78)***	2.18 (1.62 to 2.93)***	2.18 (1.53 to 3.12)***	1.58 (1.09 to 2.29)*
Cannot tell	0.58 (0.17 to 1.98)	0.65 (0.15 to 2.91)	0.91 (0.20 to 4.21)	0.58 (0.12 to 2.80)
Income				
Middle income		1.0	1.0	1.0

Low income	1.20 (0.90 to 1.59)	1.06 (0.75 to 1.50)	1.03 (0.73 to 1.46)
High income	0.71 (0.52 to 0.96)*	0.78 (0.54 to 1.12)	0.80 (0.55 to 1.16)
Smoking			
Non smokers		1.0	
Ex-smokers		2.13 (1.44 to 3.14)***	2.06 (1.39 to 3.07)***
Quitters		1.93 (0.93 to 4.01)	1.43 (0.65 to 3.12)
Current smokers		1.35 (0.99 to 1.85)	1.20 (0.87 to 1.65)
Alcohol use			
Others		1.0	1.0
Binge drinkers		1.09 (0.57 to 2.09)	0.91 (0.47 to 1.78)
Heavy drinkers		0.57 (0.33 to 0.99)*	0.52 (0.29 to 0.90)*
Abstainers		1.58 (1.10 to 2.28)*	1.56 (1.07 to 2.26)*
Body mass index			
< 30		1.0	1.0
≥ 30		1.70 (1.29 to 2.24)***	1.34 (1.00 to 1.78)*
Self-reported health			
Good			1.0
Decent			1.96 (1.48 to 2.62)***
Poor			2.72 (1.58 to 4.68)***
Number of chronic health conditions			
0			1.0
1			1.62 (1.14 to 2.32)**
≥ 2			2.08 (1.47 to 2.94)***

*p≤0.05, **p≤0.01, ***p≤0.001

Hosmer-Lemeshow test for goodness of fit, significance: [a] 0.499; [b] 0.546; [c] 0.206; [d] 0.738.

Table 3: Frequent attenders´ (FAs) and non-FAs´ use of public primary, occupational and private healthcare services. The estimates were examined only for those study subjects who estimated that they had used the service in question at least once during the previous year. To examine and compare how many of the study subjects´ had used the services, Pearson´s Chi-Square test was used. Mann-Whitney test was used to examine and compare p-values for the medians.

Healthcare sector	Pearson´s Chi-Squre test			Mann-Whitney test		
	n (%)		Significance	Median (lower and upper quartile)		Significance
	FAs n=519	Non-FAs n=4965	P-value	FAs	Non-FAs	P-value
Public primary healthcare						
Physician	465 (89.6)	1701 (34.3)	***	4.0 (2.0 to 6.0)	1.0 (1.0 to 2.0)	***
Dentist	377 (72.6)	1781 (35.9)	***	3.0 (1.0 to 5.0)	1.0 (1.0 to 2.0)	***
Public health nurse	357 (68.8)	940 (18.9)	***	2.0 (2.0 to 4.0)	1.0 (1.0 to 2.0)	***
Physiotherapist	198 (38.2)	146 (2.9)	***	4.0 (2.0 to 9.0)	1.0 (1.0 to 2.0)	***
Psychologist	85 (16.4)	40 (0.8)	***	4.0 (2.0 to 10.0)	1.0 (1.0 to 2.0)	***
Other professionals	234 (45.1)	768 (15.5)	***	1.0 (1.0 to 3.0)	1.0 (1.0 to 2.0)	***
Occupational healthcare						
Physician	228 (43.9)	2555 (51.5)	*	2.0 (1.0 to 4.0)	2.0 (1.0 to 3.0)	***
Public health nurse	181 (34.9)	2007 (40.4)		2.0 (1.0 to 2.5)	1.0 (1.0 to 2.0)	***
Psychologist	18 (3.5)	149 (3.0)		2.0 (1.0 to 3.5)	2.0 (1.0 to 3.0)	
Physiotherapist	55 (10.6)	566 (11.4)		2.0 (1.0 to 3.0)	2.0 (1.0 to 4.0)	
Private healthcare						
Physician	136 (26.6)	1232 (24.8)		1.0 (1.0 to 2.0)	1.0 (1.0 to 2.0)	
Dentist	74 (14.3)	1440 (29.0)	***	2.0 (1.0 to 4.0)	1.0 (1.0 to 2.0)	***
Physiotherapist	62 (11.9)	468 (9.4)	*	5.0 (3.0 to 10.0)	5.0 (3.0 to 10.0)	

*p≤0.05, **p≤0.01, ***p≤0.001

Table 4: Frequent attenders´ share of the visits to public primary, occupational, and private healthcare.

Healthcare sector	Total visits	Frequent attenders´ share of total visits (%)
Public primary healthcare		
All visits	16 049	7 285 (45.4)
Physician	5154	2134 (41.4)
Dentist	4365	1278 (29.3)
Public health nurse	2746	1385 (50.4)
Physiotherapist	1470	1202 (81.8)
Psychologist	641	567 (88.5)
Other	1673	719 (43.0)
Occupational healthcare		
All visits	12976	1321 (10.2)
Physician	6926	704 (10.2)
Public health nurse	3651	382 (10.5)
Psychologist	486	47 (9.7)
Physiotherapist	1913	188 (9.8)
Private healthcare		
All visits	9213	874 (9.5)
Physician	2457	250 (10.2)
Dentist	2904	195 (6.7)
Physiotherapist	3852	429 (11.1)

FAs´ share of consultations within PPHC, PHC, and OHC is illustrated in Table 4. FAs accounted for almost one-half of all consultations within PPHC, but only approximately one-tenth of all consultations within OHC and PHC. Simultaneous interpretation of Tables 3 and 4 shows how only part of FAs use different services: within PPHC, approximately 198 FAs (see Table 3) used an excess of 80% of physiotherapists´ services (see table 4), 85 FAs used almost 90% of psychologists´ services. FAs used one-half of public health nurses´ services, almost one-third of dentists´ services, and an excess of 40% of physicians´ services. Within OHC, FAs used one-tenth of physicians´ services, and one-tenth of public health nurses´ services. Within PHC, FAs used almost one-tenth of dentists´ services.

Discussion

Main findings: This study aimed to examine the characteristics of FAs of PPHC and the differences in the use of healthcare providers´ services within PPHC, PHC, and OHC. The results showed that the characteristics of middle-aged FAs pertain to employment status (unemployment and disability pension), health behaviours, dissatisfaction with one´s current life situation, and poor health. Moreover, relative to non-FAs, FAs appeared to primarily utilise different healthcare professionals´ services, as well as use the services with a greater frequency, within PPHC. At the same time, the FAs´ overall use of OHC and PHC services was noticeably lower to that of PPHC services: FAs accounted for nearly one-half of all consultations within PPHC, while only approximately one-tenth of the consultations within OHC and PHC.

Discussion of the results

In line with previous studies (Salisbury, Johnson et al. 2011), the current results indicated that having chronic health conditions were associated with frequent attendance. This is unsurprising, as most of the customers of PPHC have chronic health conditions (Sinervo, Tynkkynen et al.

2016). Also, some of the chronic health conditions require multiple visits, and visits to physicians are required in order to get prescriptions. As shown in previous studies, poor self-reported health seemed to have an association with frequent attendance (Kivelä, Elo et al. 2018, LaCalle, Rabin 2010). If the customer experiences their health as poor, although no objectively detectable reason for the visit is found, visits should not be automatically claimed as unnecessary if the customer regard their visit to healthcare as necessary.

Both drawing a disability pension and unemployment were linked to frequent attendance in multivariate logistic regression analysis, although only 12% of FAs were unemployed and 9% of them were on a disability pension. These results are consistent with the previous literature (Vedsted, Olesen 2005). In contrast, FAs have found to be a vulnerable risk group for disability pension (Bergh, Baigi et al. 2007), which is why there is uncertainty whether drawing a disability pension is the cause or the result of frequent attendance. Unemployment has been found to be both the cause and consequence of medical conditions (Herbig, Dragano et al. 2013), which may explain the result of unemployment and having chronic health conditions being associated with frequent attendance.

Other previously found characteristics associated with frequent attendance were female gender, dissatisfaction with the current life situation, ex-smoking, heavy drinking, abstinence from alcohol, and BMI ≥ 30. An accumulation of unhealthy behaviors may reflect general health conditions. A BMI over 30 and abstinence from alcohol seemed to be associated with frequent attendance, which supports the findings of previous studies (Koskela, Ryynanen et al. 2010). The result of abstinence from alcohol may be explained by the fact that alcohol use is restricted because of health conditions and required medication. The association of female gender and ex-smoking with frequent attendance is in line with a previous study, which used NFBC1966 data from 46th –year follow up study: among women, ex-smokers used PPHC services to a great extent (Keto, Ventola et al. 2017).

Present findings indicated that FAs of PPHC primarily utilised PPHC services, accounting for almost one-half of these consultations; a result which has also been found in previous studies (LaCalle, Rabin 2010). FAs´ share of the consultations within PHC and OHC was only approximately one-tenth. FAs´ higher use of PPHC services is not surprising, as the definition for a FA was based on visits to PPHC. A low employment status may have restricted the use of OHC services by some FAs, as they are not entitled to OHC, which in turn may have influenced their seeking treatment from PPHC sector. Finland´s healthcare system has been found to be unequal, as only those in the workforce have the opportunity to use OHC services. Those in low socioeconomic position have also been shown to use less PHC services due to their costly nature (Regidor, Martínez et al. 2008). Contrary to previous results (Diaz, Gimeno-Feliu et al. 2014), on the other hand, in this study low income did not seem to be associated with frequent attendance.

Many of the previous studies of frequent attendance have taken into account only visits to physicians. However, current results indicated that FAs use a broad range of different healthcare professionals´ services, particularly those provided by physiotherapists and psychologists. In Finland in 2012, a greater portion of visits to PPHC pertained to non-physicians: 70% of the consultations to PPHC were visits to other healthcare professionals than physicians (Mölläri, Saukkonen et al. 2013). FAs´ use of several healthcare professionals´ services may be due to their complex needs, which require know-how of more than one healthcare professional (Alahuhta & Niemelä, 2017). Interventions using case management and multi-professional teamwork have been found to have positive effects on frequent attendance (Hirsikangas, Kanste et al. 2018). In Finland, not all of the PPHC centres are able to provide all necessary services, for example, psychologists´ services. By that means, all of the FAs in need of different healthcare professionals´ services may not have the possibility to receive the services they need, although individual service plans are made. In Finland, no systematic identification of FAs is being made within PPHC. Nor is there consistent definition for a FA. Thus, it is of importance to take into consideration FAs´ complex needs, and the fact that the need of services is not limited to merely physicians´ services.

To our knowledge, no previous study has specifically focused on the use of the range of different healthcare professionals´ services by FAs across PPHC, PHC, and OHC sectors. The

current data provided important information of FAs´ use of additional healthcare services within the Finnish healthcare system. As the Finnish healthcare system has been found to be unequal and favouring those in the workforce, the results of this study provide important information regarding Finnish healthcare system. A major strength of the current study pertains to the study design, namely being a Finnish population-based cohort study providing information on 5484 cohort members.

Strengths and limitations

Limitations of the current study include firstly the definition of a FA as a FA of PPHC. This may have led us to overlook those who may be considered as FAs within OHC and/or PHC. However, we specifically sought to profile the FAs of PPHC, as the services provided in PPHC are financed by municipal taxation and state subsidies. As OHC services can be outsourced to both PPHC centres and PHC sector, cohort members may have based the answers on the actual site they have received care, or alternatively, the healthcare provider that has offered them care.

Apart from BMI, the data used was collected through self-administered questionnaires, which may be associated with limitations. Study subjects themselves estimated the number of visits made to healthcare providers. However, no significant differences in the reliability of determining the use of healthcare services has been reported between using medical records and self-reported information (Peersman, Pasteels et al. 2013). Of chronic health conditions, only those diagnosed or treated by a physician were included. However, the phrasing of the question (‘Have you ever had any following symptoms, sicknesses or injuries verified or treated by a doctor?’) may create ambiguity, as answers may not reflect the study subjects´ current state of health. Although the data used provided information on 5484 cohort members, the results may be underestimated as all of the cohort members who might have been considered as FAs may not have taken part in the study. Also, as this study provides information of Finnish population and Finnish healthcare system, the results of this study may not be directly generalisable to other healthcare settings.

Conclusion

From the perspective of both FAs and healthcare professionals, it is vitally important for FAs firstly to receive treatment which corresponds to their requirements, and secondly, for that the treatment be provided in cooperation between different healthcare professionals**.** Also, the need for services should be determined based on not only the use of physicians´ but also other healthcare professionals´ services. This allows the customer to have a consistent health service pathway, as well as receive effectively allocated care, while simultaneously enabling the healthcare professionals to form an overall picture of customers´ needs for care. Thus, a detailed characterisation of this customer group helps to understand the customer´s needs for care when planning appropriate health service pathway. A deeper understanding of the use of broader healthcare services by FAs provides important information on the way the services are used within Finland´s unique healthcare system, and thus enables the development of effective interventions for FAs.

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