

Health behaviours among older and younger workers with chronic illness

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ABSTRACT

Objectives: To examine health behaviours carried out by older (aged 50-69 years) and younger workers (aged 20-49 years) with a chronic illness.

Methods: Questionnaire data was collected from 759 employees with a diagnosed chronic illness. Four categories of self-managing health behaviours were examined: using prescribed medication, monitoring and responding to symptoms, managing an appropriate diet and exercising.

Results: Except for medication use, different self-managing behaviours were adopted by the age groups: younger workers with asthma, musculoskeletal pain or diabetes, preferred self-managing their illness through an appropriate diet; older workers with heart disease, arthritis and rheumatism or diabetes, preferred exercise. Except for older workers with asthma, neither age groups monitored or responded to their symptoms at work.

Conclusions: The findings from this study indicate that there are differences in diet and exercise activities among younger and older workers managing the same chronic illness.

Practice implications: To increase health behaviours at work, improved communication and understanding between the different health professions and the patient/employee is required so that different tailored approaches can be more effectively targeted both by age and within the context of the working environment, to those managing asthma, heart disease, diabetes and arthritis and rheumatism

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Introduction

As the proportion of the workforce aged 50 and above continues to grow, policies to keep people at work for longer are being adopted in a number of industrialised countries [e.g. 1]. Since increasing age is a risk factor for many illnesses, particularly chronic illnesses, the health and well-being of the older workforce is of fundamental importance. Not surprisingly then, from a public health perspective, efforts are being made to help individuals remain active and healthy by engaging in health-sustaining activities so that they can continue working for longer, retire later and remain active after retirement.

Taking into account the health demographics of older workers and the Government strategy to prevent ill-health and promote longer healthy working lives, the problem becomes how to promote and increase health-sustaining activities in the workplace, particularly for those workers already burdened by a chronic illness. Approximately one in six people in the UK report a chronic illness [2], and those aged 45 years and above are twice as more likely to report a chronic illness than those aged below 45 years. Chronic illnesses such as coronary heart disease, hypertension, arthritis, diabetes, and musculoskeletal pain are reported to be more prevalent in those aged 55-64 years old [2, 3]. In contrast, asthma is more likely to be reported by those aged below 45 years and stress, depression and anxiety is reported to be more prevalent in young-to-middle aged groups i.e. those aged 35-54 years (ONS, 2001; HSE, 2007). These chronic illnesses are prevalent in the working population and associated with high sickness absence [4], early retirement and poor health outcomes [4, 5]. To meet government targets for improving the health and well-being of people and the demands of an

ageing workforce, there is a need to better understand the needs of employees with chronic illness: i.e. how their illness affects their ability to work; how they manage their illness at work and importantly whether these needs change as the employee grows older.

Encouraging and supporting patients with, for example, heart disease, arthritis and diabetes, to carry out self-managing health behaviours such as prescribed medication adherence (estimates range from 17-80%) [6], symptom management, following an appropriate diet plan and exercising have proven to be beneficial to reducing symptoms of chronic illnesses and improving overall health and well-being [7]. However, studies on health behaviours have reported mixed findings for younger and older adults with chronic illness, with some studies reporting lower adherence to medication and other self-management behaviours in older adults compared with younger adults with type 2 diabetes, hypertension, arthritis or mental health problems [8-11], and others finding that younger adults experience more difficulty in managing medication and illnesses such as asthma, diabetes and arthritis compared with older adults [12-14]. Findings on exercise are also mixed, with some studies reporting exercise to be associated with younger age [15, 16], and other studies reporting exercise to be associated with older adults, both healthy or with a chronic illness, compared with their middle aged and younger adults counterparts [13, 17, 18]. Although physical activity has been examined for older workers [19, 20], and a number of health behaviours such as dietary changes have been examined in the workplace as part of illness prevention programmes [21, 22], there is relatively little research comparing self-managing health behaviours of older and younger

workers across different chronic illnesses. Numerous studies have shown that health and work are related. Those reporting poor health are less likely to work than those in good health [23]. Therefore, to understand how to support and facilitate health behaviours for workers managing a chronic illness in the workplace, the type of health behaviours carried out by younger and older workers in self-managing illness need to be examined.

The current study was a survey conducted among workers recruited from four large UK organisations. We examined four self-managing health behaviours typically required to be carried out by patients as advised by their physician: using prescribed medication; monitoring and responding to symptoms; managing an appropriate diet; and exercising [4]. These behaviours were examined among older workers (aged 50-69 years) and younger workers (aged 20-49 years) managing one of the following chronic illnesses: heart disease, musculoskeletal pain, asthma, depression and anxiety, diabetes, arthritis and rheumatism. We examined whether these health behaviours were carried out due to the presence of a specific chronic illness. We controlled for several confounders or possible predictors for carrying out health behaviours such as gender, body mass index, illness severity, time since diagnosis, socio-economic status and organization type.

Methods

Sample

The survey, carried out between April and September 2004, was cross-sectional and based on participants recruited from four organisations across three sectors: local government, transport and manufacturing (two companies). To ensure anonymity, workers were sent a questionnaire through their occupational health departments. The number of questionnaires sent varied according to organisational size. All workers in the two manufacturing companies were sent a questionnaire (employing 3,600 and 5,600 workers), and a random sample of one-third of workers in the local government (employing 14,000 workers) and half of all workers in the transport organisation (employing 12,000 workers) were sent questionnaires (26,200 questionnaires were sent in total across the four organisations). Completed questionnaires were returned directly to the research team by post. To monitor overall response rates, the questionnaire asked all workers, independent of their health status for demographic and job-related details. Workers managing a chronic illness were asked additional questions about their health and work. A 28% response rate (response rates ranged from 26% to 30%) was achieved for returned questionnaires ($N=7,336$), of which 21% ($N=5,264$) were completed questionnaires. While this is a below average response rate for mailed surveys of this type [24,25], this is not unusual for organisational-based questionnaires outside of annual employee surveys which are typically in the region of 27-31% due to survey fatigue [26]. The low response rate in this study may also be expected

given the study's focus on chronic illness, which may have seemed irrelevant to many workers.

Respondents were asked in the questionnaire to self-report on any medically diagnosed chronic illness they currently experienced (and had received medical treatment for), and to indicate which primary condition (if more than one was listed) *most* affected their work. This measure was developed to be consistent with other self-report measures of chronic illness [27-30]. Twenty-seven per cent (1,474 respondents) reported at least one chronic illness. A total of 17 different groups of chronic diseases were classified from the sample using the International Classification of Diseases [31] and are reported elsewhere [32]. For the purpose of this study, six of these groups were chosen for analysis: musculoskeletal pain (n = 226; those reporting pain anywhere along the musculoskeletal system: back, shoulders, neck, arms, elbows, wrist and lower limbs), arthritis and rheumatism (n = 130), asthma (n = 126), depression and anxiety (n = 118; those reporting either depression, anxiety or a combination of both), heart disease (n = 79; those reporting myocardial infarction, angina, heart failure, stroke and hypertension [39% of heart disease sample]) and diabetes (n = 80; 74% reporting diabetes II) resulting in total of 759 participants. Participants age ranged from 20-69 years (mean = 46.82 years, SD 9.10).

These chronic illness groups were chosen for several reasons. First, these illnesses are the most prevalent reported at work in this sample and in national Government surveys [e.g. 33]

which are also based on self-report data. They are also to a great extent self-managed diseases in that such individuals need to perform various health-sustaining activities by themselves [e.g. 34, 35]. These activities include self-monitoring of symptoms; proper use of medication; appropriate eating plan and regular exercise. Respondents in each of the six chronic illness groups were only selected if they had been medically diagnosed by their physician (for which they had received or are receiving treatment for); had a minimum disease duration of one year (3 months for participants with musculoskeletal pain or heart disease) to verify the illness was chronic; if they did not present co-morbidity relating to one of the other diseases in the present study (so that health behaviours related to the main illness can be ascertained); if they were required to carry out self-managing health behaviours at work by their physician; and if they reported their age.

Measures

Self-managing health behaviours carried out in the workplace were measured using a modified version of the illness symptoms Self-Management Behaviours Scale [36, 37]. Based on the scale developed by Lorig et al [36] and Clark and Dodge [37], respondents were asked to rate how closely they were following the advice of their physician in carrying out various self-management activities specific to their chronic disease whilst at work. This was measured by seven items which asked participants to rate how closely they were following the advice in taking prescribed medication (1 item), managing the symptoms of their illness as advised by their physician (4 items; monitor and respond to fatigue, pain and other

symptoms, carry out other activities beside medication to reduce symptoms), exercising whilst at work (e.g. during breaks and lunch hour ;1 item) and following an appropriate diet plan (1 item). All responses were measured on a 10 point Likert scale (1 = following advice not closely at all; to 10 = very closely). As participants carry out health behaviours outside the workplace too (i.e. at home), they were asked to rate the same questions again for behaviours carried out at home. For both home and work behaviours, if a participant was not advised on a particular behaviour, a 'not applicable' response was available for each health behaviour question.

Demographic data were collected from all respondents, on age, gender and length of employment; and occupational group was recorded according to the National Statistics Socio-economic Classification of eight-digit occupational titles for England and Wales. These were grouped into non-manual jobs (higher managerial and professional, lower managerial and professional, and intermediate) and manual jobs (lower supervisory and technical, semi routine and routine occupations).

Respondents reporting a chronic disease were asked to self-report how long they had managed their illness (time since diagnosis in months or years) and about their current severity of illness symptoms related to their reported illness (measured on a 3 point Likert scale from mild to severe). Height and body weight were recorded, and a body mass index (kg/m^2) of 25 or greater was defined as overweight.

Analyses

Age distribution were initially examined by chronic illness status and banded into three age groups 20-34 (N =89), 35-49 (N=355) and 50-69 (N=315). As the observed frequencies for heart disease, diabetes and arthritis were relatively small for the younger age group 20-34 years (Table 1), to increase statistical power, this group was combined with 35-49 age group, resulting in a final banding of two age groups: 20-49 (N= 444), 50-69 (N = 315).

Chi-square tests were conducted to compare characteristics between the two age groups and unpaired t-test were conducted to compare between the age groups on mean health behaviour scores. Linear regression analyses were performed to estimate the relationship of health behaviours for younger and older workers managing a specific chronic illness. Adjustments were made for potential confounding variables of time since diagnosis, illness severity, gender, socio-economic status and organization type. Body mass index was additionally controlled for in the analyses for diet and exercise behaviours.

Results

The demographic profile of the sample was compared with data obtained from each organisation's Human Resources department (non-responders, data not shown). Participants with chronic illnesses did not significantly differ from their respective colleagues in terms of gender and occupational status (all $p>.05$). However, those reporting heart disease and arthritis and rheumatism were significantly older than non-responders ($p<.05$). Across

organisations, musculoskeletal pain was the most reported condition. For administration and manufacturing A organisations, arthritis and rheumatism was the second most prevalent condition. For transport and manufacturing B, asthma was the second most reported condition (data not shown).

Across the three age groups, musculoskeletal pain was the most reported condition (Table 1). Musculoskeletal pain, depression and anxiety and asthma were significantly more prevalent in the 20-49 age group compared with the other two age groups. Heart disease, arthritis and diabetes were more prevalent in the 50-69 age group. Comparisons between gender on chronic illness found arthritis and rheumatism more prevalent in women and heart disease and diabetes more prevalent in men. Overall, fifty-two percent reported their chronic disease to be mild and 31% reported it as moderate ($p<.001$) (data not shown). Chi-square analyses for each illness group showed workers were more likely to report their chronic illness to be mild if they had asthma, heart disease, or diabetes ($p<.001$, in all cases). Older workers with musculoskeletal pain were more likely to report their condition as being severe ($p<.001$) (data not shown). Across the sample, 52% were obese and 27% were overweight ($p<.01$). Correlation analyses showed no association between obesity and age. Chi-square analyses for each illness group showed obesity to be prevalent in those with asthma ($p<.05$) and among those with either heart disease or diabetes in manual jobs ($p<.01$) (data not shown).

Table 2 shows the percentage of participants advised to carry out health behaviours at home and at work by their physician (irrespective of compliance). The majority of participants (56-97%) reported being advised to carry out health behaviours both at home and at work. Table 3 shows the mean difference in carrying out a particular health behaviour by younger and older workers. Older workers showed significantly higher mean scores for all four self-managing health behaviours. Results for the linear regression analyses are shown in Table 4. After adjustment for organization type, tenure, occupation, gender, and time since diagnosis, prescribed medication use at work was significantly associated with both younger and older workers with heart disease, asthma, and diabetes, but negatively associated with both younger and older workers with musculoskeletal pain. Managing an appropriate diet at work was only associated with younger workers with asthma, musculoskeletal pain or diabetes, even after additionally adjusting for BMI. Managing symptoms at work was only associated with older workers with asthma. Exercising was associated with younger workers with asthma, and with older workers with heart disease, arthritis and rheumatism or diabetes, even after additionally adjusting for BMI. In contrast, exercising was negatively associated with older workers reporting depression and anxiety.

Discussion

The main goal of this study was to explore the health behaviours carried out by younger and older workers managing a chronic illness in the workplace. The health behaviours examined were those which workers were asked to carry out by their physicians: using prescribed

medication, monitoring and responding to symptoms, managing an appropriate diet and exercising. In the present study, older workers (aged 50-69 years) had higher mean scores in carrying out self-managing health behaviours related to their chronic illness, compared to their younger counterparts (aged 20-49 years). These findings largely contradict the general literature that suggests older adults are less likely to self-manage their illness when compared with younger adults. As this study focused on workers rather than members of the general population, the findings are unsurprising and as expected, suggest a healthy worker effect. Older adults are far more likely to be working if their illnesses are mild to moderate or under control through good self-management. Those with poor self-management or illnesses that are severe are most likely to have taken early ill-health retirement [23]. This may further explain the difference in level of compliance between the younger and older workers. Younger workers reporting lower compliance may end up taking early ill-health retirement as they age, and only those with good health-management adherence are likely to remain in employment as older workers. Longitudinal research is necessary to determine this potential development.

With regard to preferences to self-managing behaviours across the different chronic illnesses by age, after controlling for individual-level (gender, time since diagnosis, severity of illness and BMI index) and organisational-level (tenure, occupation and organization type) confounders, differences in key self-managing behaviours between the two age groups emerged (Table 4). Overall, younger workers preferred self-managing behaviours that

involved managing an appropriate diet and older workers preferred exercise. Furthermore, these different self-managing behaviours were adopted by the two different age groups managing the same chronic illness. For example, older workers with diabetes were more likely to actively manage their diabetes with exercise whereas younger workers with diabetes were more likely to manage theirs through diet. The different use of self-managing behaviour strategies might potentially be explained by younger workers generally being more health-conscious with what they eat, or finding it easier to follow an appropriate diet plan at work, whereas older workers may find it more difficult to choose food with the right nutritional value. It might also be that older workers skip lunch, choosing to exercise instead, whereas younger workers might exercise after working hours. A number of psychosocial factors could also potentially explain these findings. For example, older workers may have lower self-efficacy, knowledge and social support regarding diet [9, 38]. Further research is required to corroborate these potential explanations.

The differences in dietary and exercise behaviour between the age groups may partially be explained by examining the research on exercise behaviour between the two age groups. It is possible that older workers make a personal self-assessment of how useful and effective a particular health behaviour will be to improving the status of their chronic illness in relation to their overall functional capacity and work ability. In other words, it's the effect of the chronic illness on their physical ability rather than the chronic illness itself that may motivate older workers to follow the advice of their physician with regard to exercising. These

findings corroborate the activity theory of ageing [e.g. 39], and studies on motivational factors for exercising that report older adults placed more importance on exercising if they felt it would improve their physical functional ability - such as strength, postural stability and flexibility - than on preventing illnesses *per se* [40]. This may explain the negative relationship between older workers with depression and anxiety and exercising, as depression and anxiety are perhaps perceived by workers to affect mood and cognition more than physical functional ability. In addition, those with depression may not exercise due to symptoms of fatigue associated with depression, may have withdrawn from exercise due to their illness, or may not have been recommended exercise by their health professional. However, recent research suggests an important relationship between depression and physical activity, whereby moderate levels of physical activity have been shown to improve depression, anxiety and general psychological well-being [41, 42]. Exercise has also been shown to improve aspects of mental functioning such as planning, short-term memory and decision making [43]. Therefore, encouraging workers with depression and anxiety to engage in physical activity is likely to have large potential benefits.

Both younger and older workers used prescribed medication at work for managing heart disease, asthma and diabetes. Once more, these findings contradict the general literature in that adherence to medication is on average quite poor particularly among older adults [8, 44]. Again this finding is unsurprising due to our expectations of the healthy worker effect. However, those with musculoskeletal pain who were less likely to use medication at work.

There may be certain factors associated with musculoskeletal pain not measured in this study, that may help to explain the low use of medication by these groups. For example, most types of musculoskeletal pain are mild and largely episodic, therefore not requiring prescribed medication. In addition, treatment and management of musculoskeletal pain symptoms commonly involve therapeutic strategies such as physiotherapy and massages which are perceived to be more beneficial than medication [45].

Except for older workers with asthma, neither age groups were likely to monitor and respond to symptoms at work related to chronic illness. This may be due to workplaces not being conducive to employees managing illnesses. There may be little flexibility for employees to take a few minutes to monitor their symptoms or to even be made aware of how work demands are affecting their illness. Furthermore, evidence suggests few organisations have comprehensive policies and co-ordinated systems aimed at providing health-related support and workplace adjustments [46], and employees may therefore feel deterred or prevented from carrying out self-managing behaviours. Finally, some employees may not self-manage their illness at work in fear of drawing attention to themselves and their illness due to either feeling either stigmatised by their illness or that their professional integrity is at risk [30]. On the other hand, it is also plausible that many employees check and respond to their symptoms outside of working hours which may be sufficient. Older people may be more inclined to monitor and respond to their asthma symptoms despite any potential barriers perhaps because they are more susceptible to such symptoms which may be more pronounced due to age-

related decline in lung function capacity [47]. Further research is needed here to delineate the age-related behaviour in managing asthma at work, and the potential workplace barriers, perceptions and compliance toward self-managing chronic illness at work.

There are a number of limitations to this study. The low response rate may represent a potential source of response bias. A number of explanations may account for the low response rates in this study. First, discussions with participating organisations confirmed observations of survey fatigue. This is an increasing problem faced by researchers conducting organisational based research, despite usage of response-inducing techniques [26]. Second, the study relied entirely on self-report data in identifying those with chronic illnesses, which may have either resulted in under-reporting of chronic illnesses, leading to a somewhat lower response rate. Third, those with a chronic illness may have felt distressed or uncomfortable in completing the questionnaire, or felt their illness posed no problem at work or simply chose not to fill it in due to lack of time. Nevertheless, demographic comparisons between responders and non-responders indicated no serious problems with response bias. The results from this study must be interpreted with caution as the findings from the regression analyses report small to moderate coefficients indicating that the strength of relationship between health behaviour and age are relatively small and there are perhaps other factors which may underlie this relationship that were not examined in this study (for example, aged-related health beliefs, knowledge and barriers to self-managing behaviours).

Conclusion

The findings from this study indicate that there are differences in diet and exercise activities among younger and older workers managing the same chronic illness. Further longitudinal research using is required to understand what factors encourage or deter self-management of chronic illness behaviour at work in the different age groups. Such studies can capture information on compliance, changes in self-managing behaviours, employment status and support and the fluctuations of physical, social and psychological correlates. This information would help occupational health professionals design, implement and evaluate appropriate intervention strategies in encouraging self-management of illness and to help promote such employees' well-being and minimise subsequent age-related decline in health and well-being.

Practice implications

There are a number of health promotion implications regarding our findings. The workplace is an ideal environment in which to influence and educate individuals on the benefits illness self-management can accrue. There is the need to develop a more integrated multidisciplinary approach between health professionals and occupational health in managing and delivering health education and health promotion to patients who are in employment. To increase health behaviours at work, improved communication and understanding between the different health professions and the patient/employee is required so that different tailored approaches can be more effectively targeted both by age and within the context of the

working environment, to those managing asthma, heart disease, diabetes and arthritis and rheumatism. For example, any strategy for increasing self-managing health behaviours at the workplace should include the utilisation of psychological processes to increase motivation and shape intentions and behaviours. Overall, occupational health services can help create a workplace culture that places a high value on health, educating both younger and older workers on the value of looking after their health and the benefits of following advice given by healthcare professionals.

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Table 1: Descriptive statistics for chronic disease by age (younger and older workers) and gender

Type of illness	Age		χ^2 value	Gender		χ^2 value
	20-49	50-69		Male	Female	
	N (%)	N (%)	N (%)	N (%)		
Musculoskeletal pain	150 (66.4)	76 (33.6)	8.46**	111 (49.1)	115 (50.8)	1.33
Arthritis & rheumatism	60 (47.1)	70 (53.8)	21.94**	43 (34.1)	87 (65.9)	7.80**
Asthma	87 (68.7)	39 (31.0)	16.20*	61 (48.1)	65 (51.9)	0.39
Depression & anxiety	81 (68.7)	37 (31.4)	6.26**	54 (44.6)	64 (55.4)	0.04
Heart disease	33 (41.8)	46 (58.2)	12.13**	57 (72.5)	22 (27.5)	25.33**
Diabetes	39 (48.8)	41 (51.3)	5.67	46 (57.5)	34 (42.5)	5.01**
χ^2 value	84.75**	32.41**		48.24**	90.09**	

Note: Significant: *p<.05, **p<.01

Table 2: Percentage of participants advised to carry out a health behaviour at home and at work

Type of illness	Medication				Diet				Symptoms				Exercise			
	Home		Work		Home		Work		Home		Work		Home		Work	
	N	(%)	N	(%)	N	(%)	N	(%)	N	%	N	(%)	N	(%)	N	(%)
Musculoskeletal pain	160	(70.8)	189	(83.6)	127	(56.2)	124	(54.8)	207	(91.5)	205	(90.7)	201	(88.9)	195	(86.3)
Arthritis & Rheumatism	106	(81.5)	119	(91.5)	84	(64.6)	81	(62.3)	122	(93.8)	115	(88.5)	109	(83.8)	101	(77.7)
Asthma	106	(84.1)	105	(83.3)	92	(73.0)	92	(73.0)	107	(84.9)	115	(91.0)	103	(81.7)	101	(80.2)
Depression & anxiety	96	(81.3)	93	(78.8)	70	(59.3)	69	(58.5)	105	(90.0)	100	(84.7)	92	(78.0)	79	(70.0)
Heart disease	76	(96.2)	78	(98.7)	72	(91.1)	67	(84.8)	77	(97.4)	71	(89.8)	72	(91.2)	66	(83.5)
Diabetes	78	(97.5)	78	(97.5)	77	(96.3)	77	(96.3)	78	(97.5)	77	(96.3)	75	(93.8)	75	(93.8)

Table 3: Mean difference in health behaviours carried out by younger and older workers

Work behaviour	Younger		Older		t-test
	Mean	SD	Mean	SD	
Medication	7.88	2.483	8.27	2.330	-2.531*
Diet	6.13	2.937	6.99	2.618	-4.208**
Symptoms	6.45	2.953	6.87	2.971	-2.263*
Exercise	4.69	3.025	5.34	3.086	-3.196**

*Note: Significant: * $p < .05$, ** $p < .01$.*

Table 4: Standardised regression estimates for young and older workers in health behaviours associated with chronic disease management in the workplace

	Medication		Diet		Symptoms		Exercise	
	Younger ^a	Older ^a	Younger ^{ab}	Older ^{ab}	Younger ^a	Older ^a	Younger ^{ab}	Older ^{ab}
Chronic illness [†]								
Heart disease	0.182**	0.221**	0.052	0.115	-0.065	0.053	0.063	0.183**
Asthma	0.199**	0.140**	0.131*	-0.013	-0.045	0.110*	0.115*	0.082
Musculoskeletal pain	-0.058*	-0.123*	0.171**	0.118	-0.066	-0.077	0.081	0.060
Arthritis or rheumatism	0.017	0.056	0.072	0.004	-0.020	0.031	0.007	0.127*
Diabetes	0.112**	0.145**	0.143**	0.108	-0.039	0.036	0.070	0.106*
Anxiety/depression	-0.029	-0.080	0.026	-0.110	-0.025	-0.011	-0.011	-0.114*

*p<.01, **p<.001

[†]Each chronic disease group was treated as a separate dummy variable with each chronic disease group contrasted against all other groups

^aMultiple linear regression model adjusted for organization, tenure, occupation (1 = manual, 2 = non-manual) gender (dummy coded 1=male; 2=female), illness severity, time since diagnosis

^bAdditionally adjusted for BMI (body mass index (kg/m²))

