Self-rated health and limiting longstanding illness: inter-relationships with morbidity in early adulthood

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Background	Self-rated health and limiting longstanding illness are both widely used global measures of health, but understanding is poor of their meaning and validity at younger ages.
Methods	We examined the association between self-rated health and limiting longstanding illness and specific health problems at two ages (23 and 33 years), and assessed change over the 10-year period for each health measure relative to another. Longitudinal data were taken from the nationally representative British birth cohort for which health measures were obtained at ages 23 and 33.
Results	Self-rated health and limiting longstanding illness were strongly associated with each other as well as with specific health problems, particularly with serious conditions (e.g. epilepsy, cancer, diabetes) and more weakly with less serious conditions (e.g. eczema and hay fever). Rating of overall health and limiting longstanding illness was highly stable during the 10-year period with most, but not all, health change reflecting a deterioration in health status. Deterioration in limiting illness corresponded to an even greater health decline in specific conditions.
Conclusions	Self-rated health and limiting longstanding illness are valid health measures appropriate for use in general health surveys.
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Self-rated health and measures of functional limitation are commonly used global indicators of morbidity.[1–3] Self-rated health is frequently reported as an overall assessment of health status, such as excellent, good, fair or poor, or other similar categories. For functional limitation, one frequently used measure in Europe is 'limiting longstanding illness', which is intended to focus on chronic conditions that limit an individual's activities. Chronic limiting illnesses require considerable health and social resources, and, with increasing life expectancy, have become a major public health concern. Health status monitoring is therefore an important activity for which appropriate measures are required. The two global health measures are now used so extensively that they allow international comparisons of morbidity prevalence,[1,4–7] trends over time[8–10] and of healthy life expectancy.[11–13] The usefulness of self-rated health and limiting illness for determining population health is therefore a focus of recent research.

Self-rated health has been shown to be a valid indicator of health status, particularly among the elderly. Individuals with poor health ratings tend to have higher mortality,[3,14–17] poorer physical functioning,[18–23] and psychological distress[22,24–27] compared to individuals rating their health as excellent or good. Less is known about the validity of self-rated health among younger adults, yet it is frequently used in general population health surveys covering a broad age range, including younger adults. For functional limitation, predominantly at older ages the literature on measurement is extensive.[28,29] Only a few evaluation studies exist on the validity of limiting longstanding illness,[30,31] but despite this, the measure is used in surveys of a broad age range.

In view of the current reliance on self-rated health and limiting illness it is important to improve our understanding of what they mean. Global health status measures may have a different meaning for men and women, since it is commonly assumed that women are more willing to report ill-health than men, despite inconclusive evidence on this topic.[32] It is also

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likely that the meaning of global health measures may vary with increasing age. Studies of early adulthood are desirable to determine whether health measures appropriate for older age groups also apply to a relatively healthy life stage.

The main purpose of this paper is to establish whether self-rated health and limiting longstanding illness are useful indicators of health status in early adulthood. The three aims are as follows: (1) to determine whether self-rated health is associated with other more specific diseases or health problems at two ages (23 and 33 years); (2) to establish similar associations for limiting illness; and (3) to examine changes in these two global health status measures with increasing age in association with changes in other specific diseases. We also examine whether relationships differ by gender. Data are from a nationally representative British birth cohort for which comprehensive health information was obtained at ages 23 and 33.[33]

Methods

Study sample

The 1958 birth cohort[34] originated in the Perinatal Mortality Study of all children born in England, Wales and Scotland during one week in March 1958. Information was collected on 98% of births totalling 17 414. Five follow-up studies were conducted at ages 7, 11, 16, 23 and 33, with 11 405 subjects included in the 33-year survey.[33] Despite sample attrition, those remaining in the study have been found to be generally representative of the original sample.[33,35] Biases were minimal in our study, based on ages 23 and 33. To illustrate, among those with data at age 23, 5.1% of men reported a limiting illness, compared with 5% among those with data at both ages. The figures for women were 4.1% and 3.9%, respectively.

Measures

Two global health measures reported at ages 23 and 33 were: (1) self-rated health, subjects assessed their health as excellent, good, fair or poor. Fair and poor health were combined into one group, which hereafter is referred to as poor-rated health; excellent and good categories were also combined; (2) limiting longstanding illness, respondents were asked whether they had a longstanding illness, disability or infirmity that limits daily activities in any way compared to people of the same age.

Several specific health problems were also examined at ages 23 and 33, including: (1) psychological distress, indicated by a score of ≥ 4 of 15 psychological symptoms from the Malaise Inventory,[36] (2) respiratory symptoms, one or more of morning or day/night cough or phlegm;[37] (3) obesity, defined as a body mass index (BMI, kg/m^2) >30.0. Height and weight were reported at age 23 and measured at age 33;[38] (4) asthma, indicated by past wheezing or whistling in the chest; (5) backache, respondents reported if they 'often' had backache; (6) migraine in the last year; (7) eczema in the last year; (8) hay fever in the last year. A further eight measures were available for age 33 only. Respondents reported if they had ever suffered from: (1) diabetes, (2) epilepsy, (3) cancer; or if they had suffered in the last year from: (4) heart trouble, (5) high blood pressure, (6) arthritis, rheumatism, or painful joints, and for women, (7) menstrual and (8) other gynaecological problems.

Health-related behaviours included for ages 23 and 33: (1) smoking, defined as one cigarette/day for 12 months;

(2) heavy alcohol consumption, >35 (women) and >50 (men) units/week; and at age 33 only (3) 'unhealthy' diet, classified as rare or no consumption of fresh fruit in summer and raw vegetables in winter.

Analysis

Changes in the prevalence of the specified diseases or health problems were evaluated by a McNemar's test, using the sample of individuals with data at both ages 23 and 33 years, separately for men and women. Associations between self-rated health and limiting illness and the 16 specific health problems were assessed by odds ratios (OR) estimated by a logistic regression model. In a combined analysis of men and women an interaction term was used to test gender differences. We repeated the analyses adjusting for current social class to test whether the relationships are affected by social class. Associations were almost identical with or without social class adjustment, and hence we present the unadjusted results. Odds ratios were then rank ordered separately for self-rated health and limiting longstanding illness and the similarity in the ranks was examined using Spearman's correlation coefficient. The next stage of analysis (relating to our third aim) involved an assessment of change over time (age 23–33) in self-rated health (or limiting illness) in association with corresponding changes in each specific health problem. First, we classified changes in each health measure into three categories: stable, deteriorating (health problem at age 33, but not at 23 years), or improving (health problem at age 23 years, but not at age 33). Associations between these changes were summarized with the Gamma measure, which is appropriate for ordered categorical variables;[39] here ordered as deteriorating, stable and improved health status. Finally, for pairs of health measures, we compared health deterioration among individuals without health problems on either measure at age 23 using a McNemar test. We estimated the odds of health deterioration on one health measure relative to that for another measure.

Results

Prevalence and association between health measures

Table 1 shows the prevalence of reported morbidity and health behaviour at ages 23 and 33. With age there was a general increase in the prevalence of health problems, especially for obesity and asthma/wheeze. Modest changes emerged for respiratory symptoms and, among women only, for backache. No significant changes were found for migraine, hay fever and psychological distress for men. The only significant decrease in prevalence was for psychological distress among women. Decreases in the prevalence of risky health behaviours were apparent for heavy drinking and smoking.

Self-rated health and limiting illness were strongly associated at both ages 23 and 33, and for both sexes (Table 2). This association was significantly stronger for women than for men at age 33. The OR for the global measures of health status tended to be larger than those observed for specific health problems (Tables 2 and 3). Nonetheless, both self-rated health and limiting illness were significantly associated with all other measures, except among men for hay fever and obesity, respectively.

For self-rated health OR are at least twofold, apart from for hay fever and eczema, and for obesity at age 33. There were

Table 1 Prevalence (%) of ill health and health-related behaviour at ages 23 and 33

Health and health-related behaviour	Age	Men (%)	Women (%)
N[a]	23	(6259)	(6266)
	33	(5550)	(5723)
Poor/fair rated health	23	8.4	10.8
	33	13.3	14.0
Limiting longstanding illness	23	5.1	4.1
	33	6.3	6.1
Psychological distress	23	11.5	27.2
	33	10.9	18.9
Respiratory symptoms ⩾1	23	18.3	15.7
	33	20.8	17.1
Obesity (BMI[b] >30)	23	2.3	3.1
	33	10.8	12.1
Asthma/wheezing	23	8.1	10.7
	33	27.6	28.2
Backache	23	14.7	23.2
	33	22.1	26.4
Migraine in last year	23	8.1	20.5
	33	8.0	19.7
Eczema in last year	23	3.6	7.0
	33	9.9	14.1
Hay fever in last year	23	16.6	16.4
	33	15.6	16.3
Diabetes	33	0.7	0.6
Epilepsy	33	1.2	1.3
Heart trouble in last year	33	0.7	0.8
High blood pressure in last year	33	2.8	4.0
Arthritis/painful joints in the last year	33	10.5	11.9
Cancer (ever)	33	0.6	2.3
Menstrual problems in last year	33	–	14.2
Other gynaecological problems, in last year	33	–	9.6
Health-related behaviour			
Smoking	23	57.4	60.5
	33	32.4	32.8
Drinking (heavy)	23	22.0	6.3
	33	13.0	3.5
Unhealthy diet	33	13.4	5.3

[a] Numbers vary slightly for each health measure.

[b] Body mass index.

larger OR for cancer, heart trouble and high blood pressure in the preceding year, psychological distress and epilepsy (Table 2). In comparison, OR for limiting illness tended to be stronger for chronic conditions such as epilepsy, heart trouble (preceding year), arthritis, rheumatism, painful joints and, for men, for diabetes (Table 3). Odds ratios tended to be weaker for limiting illness in relation to psychological distress, respiratory symptoms and migraine. Both global health status measures were consistent in showing weak associations with hay fever and eczema and in showing a similar relationship at both ages. Thus, in general, both self-rated health and limiting illness were strongly related to serious conditions and only modestly related to other health problems. The similar pattern of associations

was indicated by highly correlated rank ordering of OR for the two health status measures: Spearman's rank correlation was 0.62 (men) and 0.88 (women) at age 23; and 0.90 (men) and 0.79 (women) at age 33.

Generally, associations between the global health status measures and specific health problems were similar for both sexes, although exceptions for self-rated health include: asthma/wheeze and hay fever (both at age 33); and for limiting illness: eczema (age 23), hay fever, high blood pressure, arthritis and painful joints, and cancer (age 33). This similar gender pattern is summarized by Spearman's rank correlations of 0.62 for limiting illness and 0.88 for self-rated health at age 23; and 0.80 and 0.76, respectively, at age 33.

With regard to health behaviours, self-rated health was strongly associated both with smoking and unhealthy diets, but no consistent association emerged for limiting illness (Tables 2 and 3). Neither global health status measure was related to heavy alcohol consumption.

Changes in health status over time

Most subjects reported stable health status: 87% of men and 85% of women reported no change in self-rated health, and 91% and 92%, respectively, no change in limiting longstanding illness (Table 4). Poor health status at age 23 increased the risk of poor health status at age 33, for both global measures. For example, the risk of limiting illness at age 33 was 32% among men who reported a limiting illness at age 23, and only 5% among those who did not (Table 4). As expected, the predominant change in health status was deterioration rather than improvement: 64% of those reporting a change in self-rated health had deteriorated; similarly for limiting illness, 60% of those reporting a change had deteriorating health. (Identical percentages were obtained when self-rated health was used as a 4-category rather than dichotomous variable, although the number of individuals changing their health status was greater for the former.) Nonetheless, more than a third of changes in health status were improvements (Table 4), although this varied by health problem. Improvements were less evident for asthma, obesity and eczema, and greater for psychological distress and back pain (data not presented).

Change in self-rated health between ages 23 and 33 was strongly associated with change in limiting illness (gamma 0.44 for men and 0.47 for women, $P < 0.01$); and to a lesser extent, to psychological distress (gamma 0.31 for men and 0.38 for women, $P < 0.01$). Significant associations were found for other health problems, except for hay fever and among men only for eczema (results not shown). In contrast, fewer associations for limiting illness were significant and effects tended to be weaker. Changes in psychological distress (gamma of 0.29 for men and 0.28 for women, $P < 0.01$) and backache (gamma of 0.22 for men and 0.15 for women, $P < 0.01$) showed stronger relationships with changes in limiting illness.

Since most change involves worsening health status we focused on individuals who did not report poor health at age 23, and examined deterioration in self-rated health and limiting illness in relation to that occurring for specific health problems. First, we found that for women the risk of deterioration in self-rated health was 3.13 times that of deterioration in limiting illness, whilst for men the OR was 3.03. Second, the odds for deterioration in specific health problems was larger than the

Table 2 Associations between self-rated health and other health measures at ages 23 and 33, odds ratio (OR), (95% CI)

Health measure	Age	Men OR	Men 95% CI	Women OR	Women 95% CI	Gender differences
Limiting longstanding illness	23	7.96	(6.21–10.20)	10.73	(8.26–13.93)	ns
	33	6.89	(5.49–8.65)	9.81	(7.82–12.30)	$P = 0.030$
Psychological distress	23	5.44	(4.43–6.63)	5.53	(4.66–6.55)	ns
	33	4.10	(3.38–4.97)	4.80	(4.09–5.65)	ns
Respiratory symptoms ⩾1	23	3.22	(2.67–3.89)	3.77	(3.16–4.49)	ns
	33	3.02	(2.56–3.57)	3.20	(2.71–3.78)	ns
Obesity (BMI[a] >30)	23	2.62	(1.69–4.05)	2.69	(1.90–3.81)	ns
	33	1.86	(1.49–2.31)	1.87	(1.53–2.28)	ns
Asthma/wheezing	23	2.88	(2.26–3.67)	3.05	(2.50–3.73)	ns
	33	2.28	(1.94–2.68)	2.89	(2.48–3.37)	$P = 0.035$
Backache	23	2.47	(2.01–3.04)	2.98	(2.52–3.51)	ns
	33	2.57	(2.18–3.02)	2.85	(2.45–3.33)	ns
Migraine in last year	23	2.96	(2.32–3.76)	2.20	(1.85–2.62)	ns
	33	2.03	(1.60–2.57)	2.26	(1.92–2.67)	ns
Eczema in last year	23	1.56	(1.04–2.34)	1.60	(1.22–2.10)	ns
	33	1.44	(1.14–1.83)	1.62	(1.34–1.97)	ns
Hay fever in last year	23	1.12	(0.88–1.41)	1.47	(1.21–1.79)	ns
	33	0.78	(0.62–0.98)	1.33	(1.10–1.61)	$P < 0.001$
Diabetes	33	3.45	(1.76–6.78)	3.73	(1.81–7.65)	ns
Epilepsy	33	4.14	(2.47–6.92)	3.62	(2.24–5.85)	ns
Heart trouble in last year	33	6.01	(3.16–11.41)	4.02	(2.22–7.31)	ns
High blood pressure in last year	33	4.04	(2.89–5.65)	2.89	(2.16–3.87)	ns
Arthritis/rheumatism/painful joints in last year	33	2.88	(2.35–3.52)	2.81	(2.33–3.40)	ns
Cancer (ever)	33	5.18	(2.57–10.46)	2.97	(2.04–4.32)	ns
Menstrual problems in last year	33	–		2.70	(2.26–3.23)	n/a
Other gynaecological problems in last year	33	–		2.56	(2.08–3.15)	n/a
Health-related behaviour						
Smoking	23	2.25	(1.88–2.70)	2.25	(1.92–2.65)	ns
	33	1.99	(1.70–2.33)	2.06	(1.77–2.40)	ns
Drinking (heavy)	23	1.27	(1.03–1.56)	1.08	(0.79–1.49)	ns
	33	1.38	(1.12–1.71)	1.30	(0.90–1.89)	ns
Unhealthy diet	33	1.84	(1.51–2.24)	2.07	(1.58–2.72)	ns

[a] Body mass index.

odds of deterioration in limiting illness (Table 5). For example, the risk of deterioration in BMI was twice, and backache seven times that of a corresponding deterioration in limiting illness. The pattern was less consistent for self-rated health, although odds of decline for asthma/wheeze and backache were greater by more than twofold compared with the decline in self-rated health. In contrast, for hay fever (both sexes) and psychological distress (men only) the risk of decline was not as large as that observed for self-rated health. In general, trends of relative health decline were similar for men and women (Table 5).

Discussion

A recent review summarized an extensive literature on self-rated health.[3] One of the research gaps identified was that whilst studies of mortality are in abundance, few studies exist on morbidity. This is an important omission because as mortality rates decline alternative health measures are needed to monitor population health. Self-rated health has been linked to physical functioning,[18–23] but with few exceptions,[16,40] less is known

about other morbidity measures. Similarly for limiting illness, studies on the relationship with morbidity are rare.[30,31,41,42] Our investigation was designed to address this shortcoming by assessing the relationships between these global health status measures and specific morbidity. A second shortcoming of previous work is that it mainly concerns older population samples, and less is known about younger age groups. It is important to consider the meaning of self-rated health and functional limitation at a relatively healthy life stage, since evidence for other age groups may not be applicable. Serious and life-threatening conditions are more common at older ages. Nonetheless, these conditions also affect individuals in early adulthood. Our study of the nationally representative 1958 cohort, followed over a 10-year period from age 23 to 33 years, therefore contributes to the understanding of global health status measures in an age group for which knowledge is currently poor. Also, by investigating relationships for two global measures simultaneously in the same population, the results indicate the extent to which the measures are distinct and the extent to which they overlap.

Table 3 Associations between limiting longstanding illness and other health measures at ages 23 and 33, odds ratio (OR), (95% CI)

Health measure	Age	Men OR	Men 95% CI	Women OR	Women 95% CI	Gender differences
Poor/fair rated health	23	7.96	(6.21–10.20)	10.73	(8.26–13.93)	ns
	33	6.89	(5.49–8.65)	9.81	(7.82–12.30)	$P = 0.030$
Psychological distress	23	3.56	(2.73–4.78)	3.12	(2.41–4.05)	ns
	33	3.91	(3.03–5.01)	2.95	(2.35–3.71)	ns
Respiratory symptoms $\geqslant 1$	23	1.93	(1.50–2.47)	2.73	(2.08–3.59)	ns
	33	2.23	(1.77–2.82)	2.81	(2.23–3.55)	ns
Obesity (BMI[a] >30)	23	1.65	(0.88–3.08)	2.36	(1.39–4.00)	ns
	33	1.13	(0.80–1.58)	1.64	(1.23–2.19)	ns
Asthma/wheezing	23	3.29	(2.47–4.38)	3.74	(2.82–4.97)	ns
	33	1.88	(1.50–2.34)	1.83	(1.47–2.28)	ns
Backache	23	2.35	(1.81–3.06)	2.18	(1.67–2.85)	ns
	33	3.59	(2.87–4.49)	2.68	(2.16–3.34)	ns
Migraine in last year	23	1.76	(1.25–2.47)	1.79	(1.36–2.36)	ns
	33	1.93	(1.40–2.66)	2.37	(1.89–2.98)	ns
Eczema in last year	23	3.01	(2.01–4.50)	1.42	(0.92–2.18)	$P = 0.012$
	33	1.93	(1.43–2.59)	1.71	(1.31–2.23)	ns
Hay fever in last year	23	1.38	(1.05–1.82)	1.98	(1.49–2.63)	ns
	33	1.19	(0.89–1.58)	1.74	(1.36–2.25)	$P = 0.048$
Diabetes	33	5.98	(2.95–12.12)	2.85	(1.09–7.44)	ns
Epilepsy	33	9.49	(5.65–15.93)	4.74	(2.72–8.23)	ns
Heart trouble in last year	33	8.64	(4.45–16.77)	5.56	(2.85–10.84)	ns
High blood pressure in last year	33	5.02	(3.42–7.39)	2.63	(1.78–3.88)	$P = 0.021$
Arthritis/rheumatism/painful joints in the last year	33	5.22	(4.10–6.63)	3.68	(2.89–4.69)	$P = 0.046$
Cancer (ever)	33	6.66	(3.14–14.10)	1.82	(1.03–3.20)	$P = 0.007$
Menstrual problems in the last year	33	–		2.78	(2.17–3.55)	n/a
Other gynaecological problems in last year	33	–		2.43	(1.83–3.22)	n/a
Health-related behaviour						
Smoking	23	1.16	(0.93–1.45)	1.11	(0.86–1.43)	ns
	33	1.24	(0.99–1.55)	1.25	(1.00–1.56)	ns
Drinking (heavy)	23	0.81	(0.60–1.08)	0.79	(0.45–1.40)	ns
	33	1.35	(1.00–1.80)	1.13	(0.65–1.97)	ns
Unhealthy diet	33	1.48	(1.12–1.96)	1.31	(0.85–2.02)	ns

[a] Body mass index.

Three main findings emerged. First, poor health status at age 23, either for self-rated health or for limiting illness, increased the risk of poor health as assessed by these same indicators 10 years later. This stability of poor health status suggests that even in early adulthood self-rated health and reported limiting illness do not merely reflect transitory health states. The expected trend of health decline with increasing age predominated, but even so, improvements in health status were also observed. This may in part reflect adaptation or normalization, with individuals modifying their perceptions over time on whether they are limited in their activities. Some improvements in health status are also likely, given that natural history studies show symptom remission for conditions, such as epilepsy[43] and asthma/wheeze,[44,45] affecting individuals in early adulthood.

Second, self-rated health and limiting illness whilst not completely overlapping were strongly associated with each other and with particular health problems prevalent in early adulthood. Both self-rated health and limiting illness were more strongly associated with serious conditions (e.g. epilepsy, cancer, diabetes) than with less serious conditions (e.g. eczema and hay fever), a pattern that was particularly pronounced for limiting illness. Self-rated health appeared to be more consistently related to health behaviours, specifically smoking and 'unhealthy' diet, than limiting illness. Associations with heavy drinking were weaker, which may be due to the non-linear trend in this population, whereby poor health status is greater among both non- and heavy drinkers.[46]

Third, changes in self-rated health and limiting illness appeared to mirror concurrent changes in specific morbidities over the same period. Most importantly, the deterioration in limiting illness corresponded to even greater deterioration in other conditions, such as backache and asthma/wheeze. This provides corroboration that limiting illness status had deteriorated, as reporting of specific conditions is considered to be less subjective than global health assessments.[47]

In general, the pattern of relationships and changes over time was similar for men and women. This finding accords with the limited evidence to date[32,42,48,49] and supports the conclusion

Table 4 Stability and change, age 23 to 33 in health status: self-rated health and limiting longstanding illness (%)

| | Age 33 | | | |
| | Self-rated health | | Limiting illness | |
Age 23	No illness	Ill health	No illness	Ill health
Men (n = 4674)[a]				
No illness	3881 (90)	421 (10)	4243 (95)	201 (5)
Ill health	207 (56)	165 (44)	157 (68)	73 (32)
Women (n = 4960)[a]				
No illness	4017 (90)	445 (10)	4526 (95)	249 (5)
Ill health	286 (57)	212 (43)	136 (74)	49 (26)

[a] Sample with data on both health measures at both ages.

Table 5 Health deterioration[a]: odds of decline in specific health problems relative to decline in self-rated health and limiting longstanding illness

| | Self-rated health | | | | Limiting illness | | | |
| | Men | | Women | | Men | | Women | |
Health measure	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
Psychological distress	0.61	(0.50–0.73)	1.11	(0.92–1.35)	1.64	(1.32–2.04)	2.50	(2.00–3.13)
Respiratory symptoms ⩾1	1.75	(1.49–2.08)	1.16	(1.00–1.37)	4.17	(3.33–5.00)	2.70	(2.27–3.33)
Obesity (BMI[b] >30)	0.94	(0.80–1.10)	0.88	(0.76,1.03)	2.12	(1.49,2.56)	1.89	(1.59–2.22)
Asthma/wheezing	3.03	(2.63–3.57)	3.12	(2.70–3.57)	7.69	(6.25–9.09)	6.67	(5.56–7.69)
Backache	2.38	(2.04–2.78)	2.94	(2.50–3.45)	7.14	(5.88–9.09)	7.14	(5.56–8.33)
Migraine in last year	0.49	(0.41–0.59)	1.41	(1.19–1.64)	1.18	(0.95–1.45)	3.12	(2.56–3.70)
Eczema in last year	0.88	(0.76–1.03)	1.15	(0.99–1.33)	2.08	(1.72–2.50)	2.27	(1.92–2.70)
Hay fever in last year	0.55	(0.46–0.66)	0.62	(0.53–0.74)	1.31	(1.06–1.64)	1.41	(1.15–1.69)

[a] Deterioration is defined as a poor health at age 33, but not at age 23.

[b] Body mass index.

that men and women appear to be assessing similar symptoms and disease experiences when they report their health status.

With regard to specific health problems, our study is consistent with previous research showing that poor-rated health is strongly associated with global measures of physical functioning, including limiting illness.[18,20,23,27,50,51] This provides support for the view that perceived health status mainly reflects an underlying disease burden.[16] But this interpretation is not to deny that self-ratings are affected by subjective influences. Hence, we observe an elevated risk of poor-rated health among those with psychological distress in the 1958 cohort, which agrees with findings reported elsewhere.[22,24–27] The subjectivity of self-rated health might be regarded as a shortcoming, but as indicated on numerous occasions,[52,53] physical and psychological health are inextricably linked. The direction of association is often uncertain, with evidence existing for both poor psychological outcomes for those with physical disabilities,[54] and conversely, for poorer physical outcomes among those with psychological symptoms (e.g. for back pain).[55,56]

Men and women with poor-rated health were more likely to be obese and more likely to smoke and have an unhealthy diet, as shown in other studies.[14,24,48,57,58] This suggests that when individuals assess their health status they process a wide range of information on factors relevant to their health.[3] Thus,

self-assessment will be based not just on current symptom and ill-health experience, but on lifestyles and other characteristics that influence the risk of morbidity and mortality. In contrast, relationships with smoking and diet were less pronounced for limiting illness than for self-rated health, suggesting that individuals reporting a limiting illness focus less on the broader range of mortality risk factors. As expected, those reporting a limiting illness were more likely to have specific chronic conditions, such as heart problems, epilepsy and diabetes. This adds to evidence from other studies in which individuals reporting functional limitation were more likely to have heart disease, as well as other chronic conditions, such as diabetes, arthritis and asthma.[30,31,41,42,59–61]

Only a few studies exist with which we can compare our results on the stability of health status in early adulthood. Previous studies tend to differ in their approach.[23] or focus on the elderly.[4,21,42,62–65] Changes in global health status measures are rarely examined in relation to corresponding changes across multiple morbidities. We find, as expected, a decline in health status over the 10-year period examined. Health decline is generally attributed to the biological effect of aging, but studies of the elderly are presenting alternative patterns.[66] For example, Beckett et al.[64] reported improvement and stability in health status among some individuals. In our

study too, most, but not all, change represented health decline. The likelihood of decline was greatest for the specific health problems, smallest for limiting illness, and intermediate for self-rated health. This reflects the greater stability of limiting illness due to the chronicity of conditions reported.[30,42] Reassuringly, however, the pattern of worsening health status for the global measures corresponds to declines in health for specific health problems.

The general conclusion from this study is that self-rated health and functional limitation are valid health status measures appropriate for use in general health surveys, which include younger as well as older age groups.

Acknowledgements

KEY MESSAGES

- Self-rated health and limiting longstanding illness are widely used global health status measures, validated mainly in elderly populations. Little is known about the meaning of self-rated health and limiting illness in younger age groups.

- Self-rated health and limiting longstanding illness are related to specific health problems in early adulthood, especially to serious diseases. Health decline on these health status measures corresponds to deterioration for specific diseases.

- Self-rated health and limiting illness are valid global health status measures among younger as well as older age groups.

References

[1] Lahelma E, Manderbacka K, Rahkonen O, Karisto A. Comparisons of inequalities in health: evidence from national surveys in Finland, Norway and Sweden. *Soc Sci Med* 1994;**38:**517–24.

[2] Kunst AE, Geurts JJM, van den Berg J. International variation in socioeconomic inequalities in self reported health. *J Epidemiol Community Health* 1995;**49:**117–23.

[3] Idler EL, Benyamini Y. Self rated health and mortality: a review of twenty-seven community studies. *J Health Soc Behavior* 1997;**38(March):** 21–37.

[4] Schroll M, Ferry M, Lund-Larsen K, Enzi G. Assessment of health: self perceived health, chronic diseases, use of medicine. *Eur J Clin Nutr* 1991;**45(Suppl.3):**169–82.

[5] Marmot M, Ryff CD, Bumpass LL, Shipley M, Marks NF. Social inequalities in health: next questions and converging evidence. *Soc Sci Med* 1997;**44:**901–10.

[6] van Doorslaer E, Wagstaff A, Bleichrodt H *et al*. Income-related inequalities in health: some international comparisons. *J Health Econ* 1997;**16:**93–112.

[7] Cavelaars AE, Kunst AE, Geurts JJ *et al*. Differences in self reported morbidity by educational level: a comparison of 11 western European countries. *J Epidemiol Community Health* 1998;**52:**219–27.

[8] Heistaro S, Vartiainen E, Puska P. Trends in self rated health in Finland 1972–1992. *Prev Med* 1996;**25:**625–32.

[9] Dunnell K. Are we healthier? In: Charlton J, Murphy M (eds). *The Health of Adult Britain 1841–1994*. London: The Stationery Office, 1997, pp.173–81.

[10] Lahelma E, Rahkonen O, Huuhka M. Changes in the social patterning of health? The case of Finland 1986–1994. *Soc Sci Med* 1997;**44:**789–99.

[11] Robine JM, Blanchet M, Dowd JE. *Health Expectancy: First Workshop of the International Healthy Life Expectancy Network (REVES)*. London: HMSO, 1992.

[12] Guralnik JM, Land KC, Blazer D, Fillenbaum GG, Branch LG. Educational status and active life expectancy among older blacks and whites. *N Engl J Med* 1993;**329(July 8):**110–16.

[13] Valkonen T, Sihvonen AP, Lahelma E. Health expectancy by level of education in Finland. *Soc Sci Med* 1997;**44:**801–08.

[14] Wannamethee G, Shaper AG. Self-assessed health status and mortality in middle-aged British men. *Int J Epidemiol* 1991;**20:**239–45.

[15] Wolinsky FD, Johnson RJ. Perceived health status and mortality among older men and women. *J Gerontol* 1992;**47:**S304–12.

[16] Kaplan GA, Goldberg DE, Everson SA *et al.*. Perceived health status and morbidity and mortality: evidence from the Kuopio ischaemic heart disease risk factor study. *Int J Epidemiol* 1996;**25:**259–65.

[17] Miilunpalo S, Vuori I, Oja P, Pasanen M, Urponen H. Self-rated health status as a health measure: the predictive value of self-reported health status on the use of physician services and on mortality in the working age population. *J Clin Epidemiol* 1997;**50:**517–28.

[18] Segovia J, Bartlett RF, Edwards AC. An empirical analysis of the dimensions of health status measures. *Soc Sci Med* 1989;**29:**761–68.

[19] Rakowski W, Cryan CD. Associations among health perceptions and health status within three age groups. *J Aging Health* 1990;**2:**58–80.

[20] Brazier JE, Harper R, Jones NM *et al*. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. *BMJ* 1992;**305:**160–64.

[21] Idler EL, Kasl SV. Self-ratings of health: do they also predict change in functional ability? *J Gerontol B Psychol Sci Soc Sci* 1995;**50:**S344–53.

[22] Farmer MM, Ferraro KF. Distress and perceived health: mechanisms of health decline. *J Health Soc Behavior* 1997;**39:**298–311.

[23] Ferraro KF, Farmer MM, Wybraniec JA. Health trajectories: long term dynamics among black and white adults. *J Health Soc Behavior* 1997;**38:**38–54.

[24] Krause NM, Jay GM. What do global self-rated health items measure? *Med Care* 1994;**32:**930–42.

[25] Sullivan M, Karlsson J, Ware JE Jr. The Swedish SF-36 Health Survey—I. Evaluation of data quality, scaling assumptions, reliability and construct validity across general populations in Sweden. *Soc Sci Med* 1995;**41:**1349–58.

[26] Pikó B, Barabás K, Boda K. Frequency of common psychosomatic symptoms and its influence on self perceived health in a Hungarian student population. *Eur J Pub Health* 1997;**7:**243–47.

27 Manderbacka K, Lahelma E, Martikainen P. Examining the continuity of self-rated health. *Int J Epidemiol* 1998;**27:**208–13.

28 Katz S, Downs TD, Cash HR, Grotz RC. Progress in development of the index of ADL. *Gerontologist* 1970;**10:**20–30.

29 Verbrugge LM, Jette AM. The disablement process. *Soc Sci Med* 1994; **38:**1–14.

30 Cohen G, Forbes J, Garraway M. Interpreting self reported limiting long term illness. *BMJ* 1995;**311:**722–24.

31 Payne N, Saul C. Self reported limiting long term illness: how is a positive answer to this question associated with the presence of common symptoms and conditions? *J Epidemiol Community Health* The Society for Social Medicine 43rd Annual Scientific Meeting (8–10 September), 9–10. 1999.

32 Macintyre S, Ford G, Hunt K. Do women 'over-report' morbidity? Men's and women's responses to structured prompting on a standard question on long standing illness. *Soc Sci Med* 1999;**48:** 89–98.

33 Ferri E (ed.). *Life at 33: The Fifth Follow-up of the National Child Development Study*. London: National Children's Bureau, 1993.

34 Centre for Longitudinal Studies Institute of Education. *National Child Development Study Composite File including selected Perinatal Data and sweeps one to five (computer file)*. National Birthday Trust Fund, National Children's Bureau, City University Social Statistics Research Unit (original data producers). SN: 3148. Colchester, 1994.

35 Power C, Manor O, Fox AJ. *Health and Class: The Early Years*. London: Chapman Hall, 1991.

36 Rodgers B, Pickles A, Power C, Collishaw S, Maughan B. Validity of the Malaise Inventory in general population samples. *Soc Psychiatry Psychiatr Epidemiol* 1999;**34:**333–41.

37 Medical Research Council. *Questionnaire on Respiratory Symptoms*. London: MRC, 1970.

38 Power C, Lake JK, Cole TJ. Body mass index and height childhood to adulthood in the 1958 British born cohort. *Am J Clin Nutr* 1997;**66:** 1094–101.

39 Agresti A. *Categorical Data Analysis*. New York: Wiley, 1990.

40 Barsky AJ, Cleary PD, Klerman GL. Determinants of perceived health status of medical outpatients. *Soc Sci Med* 1992;**34:**1147–54.

41 Verbrugge LM, Lepkowski JM, Impivaara O. Comorbidity and its impact on disability. *Milbank Quarterly* 1989;**67:**450–81.

42 Kaplan GA, Strawbridge WJ, Camacho T, Cohen RD. Factors associated with change in physical functioning in the elderly. *J Aging Health* 1993;**5:**140–53.

43 Kurtz Z, Tookey P, Ross E. Epilepsy in young people: 23 year follow up of the British national child development study. *BMJ* 1998;**316:** 339–42.

44 Sears MR. Growing up with asthma. *BMJ* 1994;**309:**72–73.

45 Strachan DP, Butland BK, Anderson HR. Incidence and prognosis of asthma and wheezing illness from early childhood to age 33 in a national British cohort. *BMJ* 1996;**312:**1195–99.

46 Power C, Rodgers B, Hope S. U-shaped relation for alcohol consumption and health in early adulthood and implications for mortality [letter]. *Lancet* 1998;**352:**877.

47 Idler EL. Self assessed health and mortality: a review of studies. *Int Rev Health Psychol* 1992;**1:**33–54.

48 Manderbacka K, Lundberg O, Martikainen P. Do risk factors and health behaviours contribute to self-ratings of health? *Soc Sci Med* 1999;**48:**1713–20.

49 Makela M, Heliovaara M, Sievers K, Knekt P, Maatela J, Aromaa A. Musculoskeletal disorders as determinants of disability in Finns aged 30 years or more. *J Clin Epidemiol* 1993;**46:**549–59.

50 Fylkesnes K, Forde OH. Determinants and dimensions involved in self-evaluation of health. *Soc Sci Med* 1992;**35:**271–79.

51 Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992;**30:**473–83.

52 Stansfeld SA, Smith GD, Marmott M. Association between physical and psychological morbidity in the Whitehall II study. *J Psychosom Res* 1993;**37:**3–227–238.

53 Bruce ML, Seeman TE, Merrill SS, Blazer DG. The impact of depressive symptomatology on physical disability: MacArthur Studies of Successful Aging. *Am J Public Health* 1994;**84:**1796–99.

54 Pless IB, Power C, Peckham CS. Long-term psychosocial sequelae of chronic physical disorders in childhood. *Pediatrics* 1993;**91:**1131–36.

55 Magni G, Marchetti M, Moreschi C, Merskey H, Luchini SR. Chronic musculoskeletal pain and depressive symptoms in the National Health and Nutrition Examination. I. Epidemiologic follow-up study. *Pain* 1993;**53:**163–68.

56 Croft PR, Papageorgiou AC, Ferry S, Thomas E, Jayson MIV, Silman AJ. Psychologic distress and low back pain: evidence from a prospective study in the general population. *Spine* 1996;**20:**2731–37.

57 Ferraro KF, Yu Y. Body weight and self-ratings of health. *J Health Soc Behav* 1995;**36:**274–84.

58 Kunst AE, Mackenbach JP. International variation in the size of mortality differences associated with occupational status. *Int J Epidemiol* 1994;**23:**1–9.

59 Guralnik JM, Kaplan GA. Predictors of healthy aging: prospective evidence from the Almeda county study. *Am J Public Health* 1989;**79:** 703–08.

60 Hubert HB, Bloch DA, Fries JF. Risk factors for physical disability in an aging cohort: the NHANES I Epidemiologic Follow-up Study. *J Rheumatol* 1993;**20:**480–88.

61 Manninen P, Heliovaara M, Riihimaki H, Makela P. Does psychological distress predict disability? *Int J Epidemiol* 1997;**26:**1063–70.

62 Manton KG. A longitudinal study of functional change and mortality in the United States. *J Gerontol* 1988;**43:**S153–61.

63 Roos NP, Havens B. Predictors of successful aging: a twelve-year study of Manitoba elderly. *Am J Public Health* 1991;**81:**63–68.

64 Beckett LA, Brock DB, Lemke JH *et al.* Analysis of change in self-reported physical function among older persons in four population studies. *Am J Epidemiol* 1996;**143:**766–78.

65 Leinonen R, Heikkinen E, Jylha M. Self rated health and self assessed change in health in elderly men and women—a five year longitudinal study. *Soc Sci Med* 1998;**46:**591–97.

66 Rowe JW, Kahn RL. Human ageing: usual and successful. *Science* 1987;**237:**143–49.