



## The meaning of self-perception of health in the UK armed forces

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**Objectives.** We assessed the characteristics of self-perception of health (SPH) in relation to psychological distress and physical symptoms, and willingness of servicemen to see their Medical Officer (MO) by their SPH rating.

**Design.** We randomly selected 4,500 servicemen to receive either a full or an abridged screening questionnaire.

**Measures.** The full questionnaire included 6 items from the short-form 36 and the question on SPH, the General Health Questionnaire-12, the post-traumatic stress disorder checklist and 15 symptoms. The abridged questionnaire included a subset of items from the full questionnaire. All 'screen-positive' and a random 'screen-negative' sample were invited to see an MO.

**Results.** 67.1% out of 4,500 servicemen completed the questionnaires. SPH was strongly associated with a summary short form-36 (SF-36) measure. There was a strong association between SPH and all assessment scales regardless of length of the questionnaires ( $p < .001$ ). Even among those with *very good* or *excellent* SPH, high scores denoting psychological distress were prevalent (8.1%). *Good* SPH provided the largest variations in symptoms and scores. Servicemen with a *poor/fair* SPH were no more likely to accept a visit to the MO than the rest.

**Conclusions.** SPH is an excellent question for surveillance because it is highly associated with psychological health but, at an individual level, it may convey different meanings depending on the person's individual interpretation of the term health. Symptomatic social avoidance may be high among servicemen who have a *poor/fair* SPH and methods, such as buddy support, may be helpful in decreasing isolation among those who may need professional support.

Self-perception of health (SPH) on its own is a powerful predictor of mortality in most studies (Idler & Benyamini, 1997; Mackenbach, Simon, Looman, & Joung, 2002). Even those who report *good* health as opposed to *excellent* health have higher mortality. SPH is associated with mood and anxiety so that a low SPH on its own or

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as part of a quality of life scale can be found even in individuals with below threshold levels of anxiety (Mendlowicz & Stein, 2000). Up to 25% of the variance in SPH might be explained by a mood dimension (Abele-Brehm & Hermer, 1993). Thus, SPH impacts on the length of life and also it may be influenced by illness. SPH and quality of life questionnaires are used as outcome measures in randomized controlled trials (RCT) in conditions that include somatic and psychological conditions (Bernhard, Sullivan, Hürny, Coates, & Rudenstam, 2001; Revicki, Simon, Chan, Katon, & Heiligenstein, 1998).

SPH is centred in the personal experience of individuals and domains such as physical, psychological and social functioning, and disease may all affect how a person perceives his quality of life (Patrick & Erickson, 1988). This summary measure of personal experience may also be affected among other factors by age, gender, culture, body image, sexual function and social network (Aaronson, Bullinger, & Ahmedzai, 1988). The robustness of SPH may be related to its inclusiveness of experiences over time. Its ability to encapsulate so many experiences may also be its weakness, because its use necessitates a good understanding of how this measure is shaped by such diverse influences, and the variation in responses between individuals.

SPH could be used in surveillance but is less likely to be useful in randomized control studies or in screening. It is unlikely that SPH could be used in a RCT or screening as a main measure because SPH may be responding to more than one stimulus and might be too insensitive as it has shown to have lower reliability than multi-item scales of quality of life (Bernhard *et al.*, 2001). For similar reasons, it is unlikely that SPH would be appropriate as the only assessment in a screening programme. Notwithstanding its limitations as a measure at an individual's level, we may want to learn how dimensions of health including psychological health impinge on the individual's SPH and what the level of agreement is between SPH and measures of psychological distress such as the General Health Questionnaire (GHQ). In the field of surveillance, understood as the ongoing and systematic collection, analysis and interpretation of data in the process of describing and monitoring health events (Centers for Disease Control, 1988; Joellenbeck, Russell, & Guze, 1999), the purpose of using SPH is to assess the need for public health action and to assess the effectiveness of an ongoing health activity in a community. Health surveillance is expected to address health and fitness concerns, political/medico-legal concerns, target resources appropriately and may help to fulfil risk communication objectives. In this context, we would like to learn about the health correlates of SPH because it may help to interpret the reasons why its prevalence may change in the population overtime. In a nutshell, it is a tool used to assess a community or an organization rather than focus on an individual. As a surveillance tool, SPH seems an appropriate tool because it is acceptable to the population, easy to understand and reflects the health status of the population in contrast to the health status of an individual.

A military population offers an opportunity for exploring the properties of SPH and quality of life measures. In contrast to most studies, this population includes mainly young adults who are physically fit. Recruitment aims to select the fittest subjects, and subsequent training aims to increase fitness so that servicemen conform to the highest levels of preparedness for fighting duties and peace enforcement activities. In spite of the high expectations of fitness and health in the military, many studies have shown a high prevalence of physical and psychological symptoms, anxiety and mood problems in servicemen (Barrett, Gray, Doebbeling, Clauw, & Reeves, 2003; Unwin *et al.*, 1999). Although the prevalence of these symptoms and conditions is higher among those who

have taken part in deployments, they are also high in the military in general (Unwin *et al.*, 1999). Likewise, health-related quality of life has been found to be poorer in Gulf War veterans than in those who were not deployed, but the differences were only moderate (Unwin *et al.*, 1999; Voelker *et al.*, 2002). In a Canadian study, those deployed in Afghanistan and South-West Asia had significantly lower scores in almost all dimensions of the short form-36 (SF-36) in comparison to a Canadian general population of similar age and gender composition (Zamorski, 2004), but such differences were not seen in the US study (Voelker *et al.*, 2002).

Because there is a paradox between the fitness of servicemen and the high prevalence of symptoms, it is worthwhile to explore the relationship and level of consistency between SPH and scores of quality of life and scores in psychological and symptoms assessments. Although we would expect some lack of insight or inconsistencies in some individuals, the norm would be that those who have high levels of anxiety and depression or a large number of unexplained symptoms would tend to assess their SPH as *poor* or *fair*. If this were not the case, it would mean that SPH in young individuals would be open to a variety of explanations such as physical fitness rather than ill-health, or an intentional exaggeration of symptoms. Unfamiliar hazards, environmental exposures and deployments might be related in a different manner to SPH perception and to mental health (Wessely *et al.*, 2003). Studying the relation between the two constructs, SPH and mental health scales, may help us to understand better the properties of SPH.

In 2003, we developed a screening questionnaire to detect possible physical and psychological illness (Rona, Jones, French, Hooper, & Wessely, 2004). In the questionnaire, in addition to a psychological distress test, a scale of post-traumatic stress disorder (PTSD checklist), multiple physical symptoms assessment, tobacco consumption and alcohol intake behaviour, we included an item to assess SPH and also items on quality of life. The purpose of the SPH item was to assess its added value in comparison to the other tests in the questionnaire. We have already reported low acceptability and low validity of screening for psychological illness in the military (French, Rona, Jones, & Wessely, 2004; Rona, Hooper, Jones, French, & Wessely, 2004; Rona, Jones *et al.*, 2004), and our scepticism about screening for psychological illness has been unambiguously expressed in a broader context (Rona, Hyams, & Wessely, 2005). Thus, the aim of this current analysis is not to propose SPH as a screening tool. We are interested to assess the association between SPH and other items of quality of life; the relation between SPH and the physical and psychological scales used in the study, and health-related behaviour in terms of smoking and drinking. We also wanted to assess how the SPH item influenced attendance to a medical centre and expectations from a consultation with a doctor. We were particularly interested in SPH in contrast to quality of life scales, because the latter are as long as any psychological scale, and the majority of them overlap with psychological scales. SPH has the attraction of being a one-question item and there is pressure to keep questionnaires as short as possible. In terms of military deployment, this study was conducted in a period of relative calm prior to the 2003 Iraq war.

## **Methods**

In the study, two groups were randomly selected: one to receive a full screening questionnaire and another to receive an abridged questionnaire. Participants were selected using a two-stage sampling process. A random sample of 100 Royal Navy, Army

and Royal Air Force units was selected, stratified by service and size of unit. Units were randomly allocated to receive either the full or the abridged questionnaire (an equal number of each) and subsequently 45 individuals from each unit were chosen at random to take part. Altogether, 4,500 men and women were selected and all servicemen (refers to both genders from now on) in a unit received the same type of questionnaire. The questionnaires were individually addressed and sent through Commanding Officers. Three mailings were carried out to increase response. The study obtained ethical approval from the Defence Medical Services Clinical Research Committee.

The full questionnaire included 10 items of the SF-36 (Ware, Snow, Kosinski, & Gandek, 1993), the SPH item from the SF-36 provided five alternatives from *poor* to *excellent*, the civilian version of the PTSD checklist (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), the GHQ-12 as a measure of psychological distress (Goldberg & Williams, 1988), 15 symptoms from a previous questionnaire (Unwin *et al.*, 1999), three questions from the WHO audit questionnaire (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) and smoking behaviour. The abridged questionnaire included the SPH item, a PTSD checklist of 14 rather than 17 items, 4 items from the GHQ-12 (Jacobsen, Hasvold, Hoyer, & Hansen, 1995) and 5 of the 15 symptoms. Questions on alcohol and smoking behaviour were excluded from the abridged questionnaire.

We used pre-established criteria of high scores for the analysis. For the full questionnaire, these were  $\geq 5$  mild or combination of mild and moderate symptoms;  $\geq 3$  moderate symptoms; at least one severe symptom; GHQ-12 score  $\geq 4/5$ ; PTSD score of 50 or more; alcohol intake estimates of 40 + units a week in males and 30 + in females or another person expressing concern about a serviceman's drinking in the past year. The pre-established criteria of the abridged questionnaire were at least three mild or moderate symptoms or at least one severe symptom, GHQ score  $\geq 1/2$ ; PTSD score  $> 40$ . Information was also obtained on gender, service, age, rank and number of deployments since 1999.

We invited all those who had at least one health dimension above the threshold and a random sample of those who did not have scores above the threshold to attend the medical centre. The ratio between the two groups was 1:1. We assessed the percentage that accepted a referral to the Medical Officer (MO) by SPH status, and from an additional short questionnaire, whether the SPH status was related to the doctor's assessment as to whether the servicemen needed medical help. We also assessed the participants' expectations from the consultation in terms of tests, prescriptions and referral to specialists according to their SPH status and the relationship between the serviceman's SPH and what they received in terms of tests, prescriptions and referral, from both the MOs' and the patients' independent reports.

SPH was analysed in three categories: *very good/excellent*, *good* and *fair/poor*. Effects of rank, service, gender, age and number of deployments on SPH were assessed using ordinal logistic regression (number of deployments was treated as a nominal independent variable with three categories: none, one only and more than one). Effects of SPH on limitation of activities, problems on other health dimensions, and results of consultations were assessed using logistic regression, adjusting for rank, service, gender, age and number of deployments.

## Results

The response rates to the full and abridged questionnaires were 64.7% and 69.6%, respectively. Those who completed the questionnaire were more likely to be women, older personnel and officers than were non-responders (Table 1). The distribution of

**Table 1.** Sample characteristics by completion of the questionnaire and type of questionnaire completed

Characteristics	Responders			Non-responders N = 1,627
	Full questionnaire N = 1,382	Abridged questionnaire N = 1,491	Total N = 2,873	
% Males	92%	92%	92%	94%
Mean age (SD) in years	32.3 (7.8)	32.5 (7.9)	32.4 (7.9)	29.9 (7.8)
Service				
Army	48%	47%	48%	49%
Royal Navy	23%	24%	24%	24%
Royal Air Force	29%	29%	29%	27%
Rank				
Officers	19%	23%	21%	11%
Other ranks	81%	77%	79%	89%

responders and non-responders by service closely corresponded. Table 2 gives the characteristics of the samples by SPH status of the total sample. Officers and RAF personnel were more likely to perceive themselves as having *very good* or *excellent* health in comparison to other ranks and personnel from other services. Number of deployment was associated with poorer SPH, but only in those who had one deployment only. Gender and age were unrelated to SPH. There was a very strong association between SPH and each of the six out of the ten items of the SF-36 items in the

**Table 2.** Self-perception of health according to characteristics of respondent

	Self-perception of health				p value
	Very good/excellent (N = 1,683) No (%)	Good (N = 852) No (%)	Fair/poor (N = 338) No (%)	Total (N = 2,873) No (%)	
Rank					<.001
Officers	438 (72.8)	130 (21.6)	34 (5.6)	602 (100)	
Other ranks	1,245 (54.8)	722 (31.8)	304 (12.5)	2,271 (100)	
Service					<.001
Army	796 (58.2)	400 (29.3)	171 (12.5)	1,367 (100.0)	
Navy	348 (50.9)	249 (36.4)	87 (12.7)	684 (100.0)	
Royal Air Force	539 (65.6)	203 (24.7)	80 (9.7)	822 (100.0)	
Gender					.58
Female	138 (59.7)	70 (30.3)	23 (10.0)	231 (100.0)	
Males	1,545 (58.5)	782 (29.6)	315 (11.9)	2,642 (100.0)	
Deployments					.006
None	719 (59.4)	360 (29.8)	131 (10.8)	1,210 (100.0)	
One	526 (54.7)	307 (31.9)	128 (13.3)	961 (100.0)	
More than one	438 (62.4)	185 (26.4)	79 (11.3)	702 (100.0)	
Age (years)					.50
< 30	608 (57.6)	325 (30.8)	123 (11.6)	1,056 (100.0)	
≥ 30	1,075 (59.2)	527 (29.0)	215 (11.8)	1,817 (100.0)	

full questionnaire selected for this analysis (Table 3). The association was strong between SPH level and at least one item of the SF-36 showing limitation, difficulty or interference with health or work. However, a large percentage of servicemen who had a *good* SPH reported limitations in vigorous activity, that their health interfered with their social activities or that their work suffered as a result of their health. Although the percentages were low, an appreciable number of servicemen who ticked *very good* or *excellent* SPH complained about their performance due to health problems. Thus, 18.8% of those with *excellent* or *very good* health ticked at least one of the quality of life items indicating a health problem and so did 41.2% of those who ticked *good* health. Nearly 30% of those who said that they have *poor* or *fair* SPH said that they did not experience any problems of health. The item from the SF-36 'my health is excellent' divided into four categories and the SPH of health had a very high agreement (Goodman and Kruskal's  $\gamma = 0.81$ ), but individuals who ticked the alternatives *good* or *fair* SPH did not have a clear equivalent when choosing options in relation to whether they considered their health excellent.

**Table 3.** The association of self-perception of health and other items in the short form-36 (full questionnaire only)

	Self-perception of health			<i>p</i> value (trend) adjusted*
	Very good/excellent ( <i>N</i> = 794) No (%)	Good ( <i>N</i> = 415) No (%)	Fair/poor ( <i>N</i> = 173) No (%)	
Vigorous activity limited by health ( <i>a little</i> or <i>a lot</i> )	26 (3.3)	33 (8.0)	44 (25.4)	<.001
Health has interfered with social activities ( <i>quite a bit</i> or <i>extremely</i> )	37 (4.7)	40 (9.6)	49 (28.3)	<.001
Health has meant cutting down on time at work	38 (4.8)	53 (12.8)	45 (26.0)	<.001
Health has meant less is accomplished at work	65 (8.2)	90 (21.7)	69 (39.9)	<.001
Health has limited the kind of work performed	66 (8.3)	89 (21.4)	63 (36.4)	<.001
Health has caused difficulty in performing work	56 (7.1)	78 (18.8)	71 (41.0)	<.001
At least one of the above	149 (18.8)	171 (41.2)	124 (71.7)	<.001

\*Adjusted for rank, service, gender, deployment and age.

There was a strong negative association between SPH and high number of symptoms, high GHQ and PTSD scores and current smoking (Table 4). Alcohol behaviour was borderline significant ( $p = .075$  for trend). However, many servicemen who perceived themselves as having at least *very good* health had high PTSD or GHQ scores. In terms of absolute frequency, there were more servicemen with at least *good* SPH who were above the referral threshold for symptoms and the GHQ scale. There was no evidence from our sample that the relationship between SPH and any measures in Table 4 was different for men compared with women as the tests of interaction were all *p*-values greater than 10%. The unadjusted correlations between SPH and each health

**Table 4.** The association between health dimensions and self-perception of health (full questionnaire)

	Self-perception of health			<i>p</i> value (trend) adjusted*
	Very good/excellent No (%)	Good No (%)	Fair/poor No (%)	
Full questionnaire	( <i>N</i> = 794)	( <i>N</i> = 415)	( <i>N</i> = 173)	
Symptoms	44 (5.5)	87 (30.0)	80 (46.2)	<.001
GHQ	64 (8.1)	76 (18.3)	65 (37.6)	<.001
Alcohol	85 (10.7)	60 (14.5)	27 (15.6)	.072
Current smoking	185 (23.3)	148 (35.7)	53 (30.6)	.005
Abridged questionnaire	( <i>N</i> = 889)	( <i>N</i> = 437)	( <i>N</i> = 165)	
Symptoms	8 (0.9)	23 (5.3)	27 (16.4)	<.001
GHQ	97 (10.9)	114 (26.1)	85 (51.5)	<.001
Both questionnaires	( <i>N</i> = 1,683)	( <i>N</i> = 852)	( <i>N</i> = 338)	
PTSD	19 (1.1)	21 (2.5)	34 (10.1)	<.001

\*Adjusted for rank, service, gender, deployments and age.

dimension were: SPH and symptoms 0.39 (95% CI 0.34 to 0.43), SPH and GHQ 0.35 (95% CI 0.30 to 0.40) and SPH and PTSD 0.38 (95% CI 0.33 to 0.42) for the full questionnaire and 0.29 (95% CI 0.24 to 0.34), 0.32 (0.27 to 0.36) and 0.37 (95% CI 0.33 to 0.41), respectively, for the short questionnaire. The association between smoking and SPH was due to a higher prevalence of current smokers among those who perceived themselves as having *good* or less than *good* SPH in comparison to those with at least *very good* health.

There was no evidence of an association between SPH status and whether the servicemen accepted the invitation to see a doctor ( $p = .39$  for trend; Table 5). Of those who attended the Medical Centre, there was a higher prevalence of servicemen with *poor* or *fair* SPH who, according to the doctor, needed help, but this association was mainly due to instances where the doctor was already aware of a health problem. The expectations from the medical encounter were related to SPH (Table 6). Those who had poorer SPH expected more tests and referrals. They were successful in obtaining

**Table 5.** Self-perception of health according to the likelihood to accept an invitation to see a doctor and whether the servicemen needed help from the doctors' perspective

	Self-perception of health			<i>p</i> value (trend) adjusted*
	Very good/ excellent ( <i>N</i> = 577) No (%)	Good ( <i>N</i> = 355) No (%)	Fair/poor ( <i>N</i> = 204) No (%)	
Accepted the invitation	136 (23.6)	76 (21.4)	43 (21.1)	.52
Participants who attended	( <i>N</i> = 136)	( <i>N</i> = 76)	( <i>N</i> = 43)	
Needed help according to the doctor	37 (27.2)	27 (35.5)	24 (55.8)	<.001
Needed help and previously unidentified problem	26 (19.1)	19 (25.0)	13 (30.2)	.051

\*Adjusted for rank, service, gender, deployments and age.

**Table 6.** Participants' expectations from visit to the doctor, and what he/she received by self-perception of health

	Self-perception of health			<i>p</i> value (trend) adjusted*
	Very good/excellent ( <i>N</i> = 136) No (%)	Good ( <i>N</i> = 76) No (%)	Fair/poor ( <i>N</i> = 43) No (%)	
Expectations				
Tests	16 (11.8)	18 (23.7)	16 (37.2)	<.001
Prescriptions	13 (9.6)	12 (15.8)	8 (18.6)	.10
Referral	10 (7.4)	11 (14.5)	11 (25.6)	.004
What s/he got according to the participant				
Tests	17 (12.5)	11 (14.5)	6 (14.0)	.59
Prescriptions	14 (10.3)	13 (17.1)	11 (25.6)	.015
Referral	11 (8.1)	8 (10.5)	13 (30.2)	.003
What s/he got according to the doctor				
Tests	15 (11.0)	13 (17.1)	5 (11.6)	.47
Prescriptions	13 (9.6)	15 (19.7)	10 (23.3)	.011
Referral	11 (8.1)	8 (10.5)	11 (25.6)	.015

\*Adjusted for rank, service, gender, deployments and age.

a referral to another health professional, but did not succeed in obtaining tests in comparison to those with a better SPH. There was a slight tendency for those with a poorer SPH to get more prescriptions than those with a better SPH ( $p = .015$  according to the patient or  $p = .011$ , according to the doctor). The same association was observed in terms of expectations but was borderline statistically insignificant ( $p = .10$ ).

## Discussion

SPH was highly associated with other items of the SF-36 and very highly correlated with at least one of the other six items of quality of life, indicating that the SPH item is a good summary of the rest of the quality of life items. Although SPH was highly associated with number of symptoms, GHQ, PTSD and current smoking, there was a lack of consistency between SPH and each of the variables assessed within individuals. Many servicemen who perceived to have *very good* or *excellent* health had many physical symptoms, high GHQ or high PTSD scores. Those who ticked the option *good* SPH varied widely in terms of their answers to other health questions, highlighting that the meaning that such an option conveys is highly variable between subjects. SPH was unrelated to the decision to accept a visit to the medical centre. However, more of those with a *fair* or *poor* SPH who attended expected to receive tests or a referral than the rest of the complying group.

The main strengths of this study are the design based on a random sample and a response rate that is as good as most other studies of this type (Barrett *et al.*, 2003). Therefore, we believe that our findings correspond to the whole service population. All the information on SPH, quality of health and physical and psychological scales was obtained simultaneously so that the analysis corresponded to views that the servicemen held at the same point in time. There was a time gap between completion of the



questionnaire and the visit to a doctor, and it is probable that some servicemen may have changed their SPH by the time they visited their MO. However, as threshold criteria for referral were very high in our study, it would be expected that between 72% and 55.5% of the screen positives would have persisted with a high score in the GHQ (Goldberg & Huxley, 1992) and most likely in those above the threshold in the other scales in the questionnaire. We did not include all items of the SF-36 because some of the items are less relevant to servicemen, especially those in the area of physical functioning, or they were repetitious with other components of the questionnaire and we needed to produce the shortest possible questionnaires. We decided to include elements of physical functioning, role limitations (physical), social functioning and health in general. This is in contrast with other studies of military personnel that have used the full instrument (Voelker *et al.*, 2002; Zamorski, 2004). We excluded the option *not sure* in the dimension health in general, which forced servicemen to choose definite options. We did not include questions on pain, because many options in the symptoms items of the questionnaire included questions on pain. On reflection, we regretted this decision because injury caused by training and day-to-day activities is prevalent in this population. In what follows, we have included reports using the full scale of quality of life instruments when we did not find reports based on one item only.

In line with normative data for Britain, there were no differences in the answers to SPH and quality of life in the age range of our sample, most of whom were younger than 45 years (Bowling, Bond, Jenkinson, & Lamping, 1999). This also influenced the lack of differences between genders in our study. Rank was the only variable associated with socio-economic status in our study and we showed a strong association between rank and SPH, as is usual in most studies of quality of life (Bowling *et al.*, 1999).

Most commentators have focused on the strong association between SPH and quality of life scales, and the physical and psychological scales (Abele-Brehm & Hermer, 1993; Kroenke, Spitzer, & Williams, 2002; Linzer *et al.*, 1996; Proctor, Harley, Wolfe, Heeren, & White, 2001; Unwin *et al.*, 1999; Voelker *et al.*, 2002), an association confirmed in our study. An aspect rarely explored is the lack of consistency within individuals between SPH and psychological health. The Spearman correlations between SPH and each dimension of health in our study were modest. Even in a few cases, individuals with high PTSD scores said that they had *excellent* or *very good* health. This lack of consistency was also fairly prevalent in relation to number of symptoms and their severity, and to the GHQ scale. These incongruous responses might be due to mistakes, but the consistency of the answers to the SPH item and the other SF-36 items in our study indicates that this type of error was not frequent in our study. It is more likely that incongruous responses are related to the meaning that responders give to their answers, an aspect that is largely ignored in most quantitative research output related to the SF-36 (Mallinson, 2002).

Our results correspond to other studies carried out in the military and the inconsistencies were seen in all specific scales (Voelker *et al.*, 2002). A possible explanation for our findings is that *excellent* and *very good* health may be understood, in service personnel, as being *physically fit*. In support of this interpretation, more servicemen who ticked at least *very good health* had a high GHQ score than a high symptoms score, even though high GHQ and high symptom scores had similar prevalence in our full questionnaire (Rona *et al.*, 2004). Many servicemen explained to us in the piloting stage of the questionnaire that, for them, health was frequently equated to fitness. It would be expected too that servicemen downgraded for medical reasons would have had poorer SPH than other servicemen. An alternative explanation

is that servicemen take a long-term view of their current ailments. Many servicemen who perceived themselves as having at least *very good* health and had a high score in any of the health dimensions may have taken the view that their current ailments were short lived and not severe. This may be the case because of previous experience or because of knowledge that current ailment is reactive to a known self-limiting event. There is good evidence for GHQ and symptoms that scores may change in a short period of time without mediating treatment (Marple, Kroenke, Lucey, Wilder, & Wilder, 1997), but persistence or relapse of complaints in a short period of time is related to the initial score, so that those with higher GHQ scores will tend to be less likely to experience spontaneous restitution (Goldberg & Huxley, 1992). Another possible explanation is that the answers to SPH are related to beliefs a serviceman holds about his/her current health problems. Kessler and colleagues demonstrated that patients who psychologized their symptoms were more likely to be recognized by a GP than those who tended to normalize or to somatize their symptoms (Kessler, Lloyd, Lewis, & Gray, 1999). It is uncertain whether these findings can be extrapolated to the servicemen's perception of their health, but it offers another avenue for investigating the puzzle of incongruous responses.

In general, women tend to score lower than men in the physical functioning and mental health dimensions of the SF-36 (Bowling *et al.*, 1999; Linzer *et al.*, 1996). This profile is similar to the differences in prevalence of mood and anxiety disorders (Linzer *et al.*, 1996). Women also tend to have lower SF-36 scores than men among cardiac patients (Emery *et al.*, 2004) and those with Type 1 diabetes (Huang, Palta, Allen, LeCaire, & D'Alessio, 2004). Women also seem to recover more slowly than men from PTSD (Holbrook, Hoyt, Stein, & Sieber, 2002). It has also been suggested that men, in comparison to women, may respond with a decrease in SPH to physical health problems. However, in our study, we did not find any differences in the profile of associations between SPH and psychological dimensions between genders. A possible reason for the lack of significant interactions due to gender in our study may be due to the characteristics of women who join the Armed Forces.

The meaning that a person wants to convey when he/she ticks the option *good* SPH is difficult to interpret. Among those who ticked it, there was a high prevalence of large number of symptoms, high GHQ score, excessive alcohol intake and a high percentage of current smokers, but there was low prevalence of high PTSD score. Those who ticked this option may feel indecisive about their own health. When we cross-tabulated *good* SPH against the responses to the statement 'my health is excellent', the distribution mainly corresponded to mostly true, but approximately 22% ticked *mostly false* or *definitely false*. For the great majority, ticking the option *good* indicates that their health is fine, but for many, *good* health represents a feeling of ambiguity about their own health, and yet for others, it is an understatement of unhappiness with their health. In the piloting stage of the questionnaire, some servicemen who differentiated between their physical and mental health told us that they endorsed the option *good* if they felt that their mental and physical health were at opposing ends of the spectrum. This appraisal about their health would contribute to a feeling of ambiguity when choosing an option to answer a general question about their own health. The servicemen may also be making a comparative assessment in relation to others in his institution and may also conceptualize what aspects of health he believes should be included or excluded (Mallinson, 2002).

It is counter-intuitive that those who report a *poor* or *fair* SPH were no more likely to accept an invitation to see an MO than others with a better SPH. The percentage of

participants who accepted the invitation to attend the MO was low regardless of serviceman's SPH (Rona *et al.*, 2004). The reasons for a low interest to see an MO may be related to lack of trust in the MOs specifically for psychological health problems and to preparation for the Iraq War that overlapped with the last few months of our study (French *et al.*, 2004; Rona *et al.*, 2004). We are unaware of other studies examining the effect of SPH on initiating a visit to the GP. It is of concern that servicemen with *poor* or *fair* SPH do not show more willingness to visit the MO than the rest, as it has been shown that a *poor* SPH is associated with suicidal ideation among patients with current mental disorder and suffering (Goodwin & Olfson, 2002). Among those who went to see the MO, there was an association between the expectation to get tests and/or a referral to see another health specialist and SPH, but such an association was less clear in relation to prescriptions. From the doctors and patients' accounts, we were able to confirm that servicemen expectations were met in relation to referrals, but not for tests. This may be because the tests the servicemen have in mind are not the resort of the MO, the servicemen may not have expressed their wishes clearly enough to elicit a positive response or the MO did not feel that it was an appropriate line of action. In another paper, we have compared expectations and actual events within the same individuals, and we were able to demonstrate that the relationship was, in part, dependent on the person reporting the event (i.e. the patient or the doctor; Hooper, Rona, French, Jones, & Wessely, 2004)

SPH is a good question for assessing the overall perception of health in a population. Participants are willing to provide the information, SPH is very strongly associated with other items of a quality of life scale and it is reasonably associated with illness reported in a questionnaire. Thus, we conclude that is a good measure to assess trends of health in a population. However, there are many unknowns in translating the SPH answers into a consistent feature of physical or psychological health within an individual. SPH should not be used for screening purposes because there are too many uncertainties as to why an individual perceives himself as having *poor* or *fair* health. SPH encompasses more than health within the medical model and may not measure what we think it does. It would be unsound to use SPH alone as primary outcome measure in evaluative studies and even the entire SF-36 may be inappropriate. There are gaps in our knowledge of the meaning of SPH in young adults in which many domains such as fitness, health, duration of symptoms, severity of the condition, satisfaction with life, beliefs about disease and body functioning and even the institutional context may all play a role. Mallinson (2002), in relation to the issue of context, highlighted the importance of the situation in the responder's answers and stressed the contribution of social and cultural factors on the responses. Although we endorse the use of SPH as a surveillance tool, the implications are not unambiguous and we need to be careful in the recommendations triggered by an unexpected high prevalence of *poor* and *fair* SPH. On occasion, the main recommendation might be to explore further the possible reasons for a high prevalent perception of poor health, which might imply as much about the particular population's beliefs about what constitutes health as about the prevalence of ill-health in the institution. It is surprising that those who have less than optimal SPH are not more likely to see the doctor, if offered the opportunity, than other servicemen. Symptomatic social avoidance in PTSD and social withdrawal in severe depression may have contributed to the lack of association (American Psychiatric Association, 2000; Sloman, Gilbert, & Hasey, 2003). A study to understand the reasons for such a lack of association could be fruitful.

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