



Associations between self-rated depressive symptoms and quality of life in Finnish males aged 30 to 40

**Eija Ohvanainen, Hannu Kautiainen, Ilkka Kiviranta,
Hannu Koponen**

Abstract

Depression is a common and disabling disorder which profoundly affects the quality of life of sufferers. However, few studies have been conducted in young or middle-aged males, although depression and cardiometabolic disorders are considered to be increasingly common in middle-aged males.

In our study, three cohorts, each of 1000 males were randomly drawn from the Finnish Population Information System. Approximately one-third (30.5%) participated. Self-rated depressive symptoms were assessed using the 21-item Beck's Depression Inventory (BDI). Physical activity was assessed using the International Physical Activity Questionnaire, which comprises three components: frequency of exercise (times per week), intensity of exercise (the nature of the activity) and time devoted to exercise (hours and minutes per day). The different components of quality of life were scrutinized with the RAND 36-item Health Survey (RAND-36).

We observed that when assessing the participants, with or without increased depressive symptoms, significant differences were detected for employment and economic status, level of physical activity, the use of alcohol and working ability. Significant reductions in the RAND-36 physical symptoms scores associated with increased depressive symptoms were detected only for the oldest cohort, whereas mental symptom scores were significantly lower in all cohorts for those participants who had increased depressive symptoms.

Our data suggest that even moderately increased depressive symptoms significantly affected the mental components of quality of life in all three cohorts aged 30, 35 and 40, and that they affected the physical components significantly in the oldest cohort (males aged 40).

Background

Depressive disorders are a leading cause of global disease burden (1). Major depressive disorder has lifetime prevalence estimates of up to 17% in general populations (2). The 12-month prevalence figures for depressive disorders in Finland have been between 5 and 7 per cent (3). Moreover, the impact of depression on health-related quality of life (HRQoL) is comparable to that of a major chronic physical disease. A recent Finnish study investigated how 29 common chronic diseases associated with individual level HRQoL loss, and found that depressive disorders (major depressive disorder and dysthymia) were among the most severe conditions after Parkinson's disease (4). Moreover, depressive disorders have also been associated with higher mortality (5,6,7) and reduction in physical functioning (8,9).

According to the Diagnostic and Statistical Manuals DSM-IV and DSM-5 of the American Psychiatric Association, a major depressive episode is diagnosed by a standardized interview, and the diagnosis is based on a set of diagnostic criteria. Apart from a clinical assessment, there is a long-standing tradition of self-report measures of depressive symptoms that also allows for an assessment of depression symptom severity. Although an association between increased depressive symptoms and diagnosis of depressive disorder is assumed (10), increased depressive symptoms are also associated with decreased economic earnings, due to sickness absence and even early retirement (11). In addition, extensive evidence exists that demonstrates independent, positive associations between depressive symptom levels and poor health outcomes, including the experience of pain (12,13).

Subjective (usually self-rated) health also reveals important details regarding an individual's health needs (14), functional status/disability (15) and mortality (16,17).

The objective of this study was to investigate the associations between self-rated depressive symptoms and quality of life (QoL) in Finnish males aged 30-40. This age group is seldom studied although depression and cardiometabolic disorders are considered to be increasingly common in middle-aged males.

Material and methods

Subjects and design

The study is based on cross-sectional data gathered in 2010. Three samples, each comprising 1000 males represented three cohorts born in 1969, 1974 and 1979, were included in the study. The participants were randomly drawn from the Finnish Population Information System, which is a computerized national register that is maintained by the Population Register Centre. Convicts, immigrants and mentally disabled males were excluded from the study. The draw covered the whole nation and was not weighted, and was thus representative. Women have served in the Finnish Defence Forces since 1995, but as the focus of the study was on the health of young men the females were excluded.

The participation in the study was voluntary and anonymous. All 3000 potential participants were contacted twice via mail and were provided with an information sheet, an informed consent form that they had to sign if they agreed to participate, questionnaires and also a return envelope. Those who had decided to take part in the study were provided with an opportunity to obtain additional information on the study and its proceedings, and they were allowed to withdraw from the study at any phase and were not obliged to give a specific reason for the withdrawal. The study protocol was approved by the Ethics Committee of the University of Helsinki, and permission for the study was given by the Finnish Defence Forces in 2009.

Primary Study Variables

Depressive symptoms: self-rated depressive symptoms were assessed using the 21-item Beck's Depression Inventory (18). The cut-off point of 10 was used.

Quality of life: The participants completed the RAND 36-item Health Survey (RAND-36), which is a widely used quality of life (QoL) measure (19,20). All eight SF-36 subscores in this study (physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, mental health, energy/vitality, pain perception and general health perception) were taken into consideration. Two higher order summary scores, the Physical Component Summary (PCS) and the Mental Component Summary (MCS) that represent overall physical and mental functioning, were derived from these eight subdomains as specified by the original developers (21).

Secondary study variables

The participants' *physical activity* was assessed by using the International Physical Activity Questionnaire (IPAQ), which comprises three components: frequency of exercise (times per week), intensity of exercise (the nature of the activity) and time devoted to exercise (hours and minutes per day). The product of these components indicates the level of physical activity of the participant (22).

Data on self-reported employment, economic status and use of alcohol and data on the participants' working ability were also gathered.

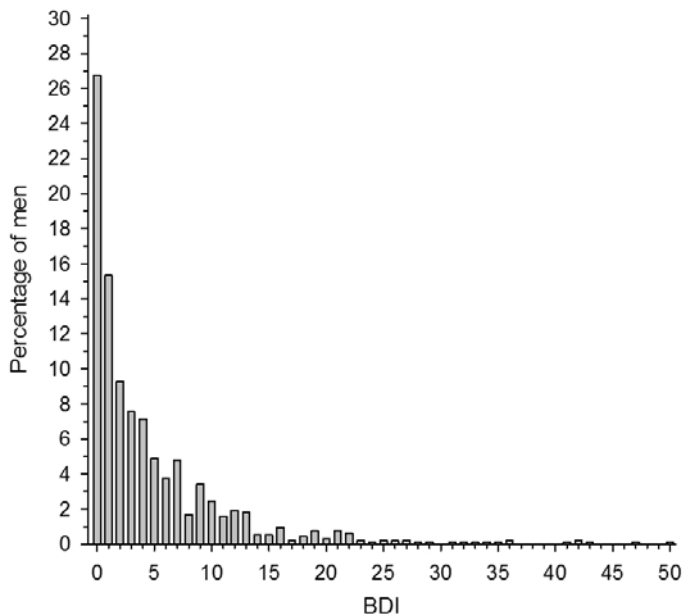
Statistical analysis

Data are presented as means with standard deviations (SD) or as counts with percentages. Moreover, 95% confidence intervals are given to the most important outcomes. Statistical comparison between the groups was performed by the Student's t-test, or by Analysis of Variance (ANOVA) when appropriate. Categorical data were evaluated by the Chi-squared test. In the case of any divergence from these assumptions (e.g. non-normality), a bootstrap type test was used. The normality of variables was evaluated by the Shapiro-Wilk W test.

Results

The response rate was 30.5%, the final total study population being 939. Two groups were formed from this population based on the reported BDI score, the cut-off point being 10. A total of 145 males/participants (15.4%, 95% CI 13.2 to 17.9) reported BDI scores of 10 or above (Dep+). The remaining 794 participants (84.6%) reported BDI scores less than 10 (Dep-). Figure 1 shows the distribution of reported BDI scores which reveals that the BDI scores reported were rather low in the Dep+ group. The mean BDI score was 4.7 (SD 6.7), range 0-50.

Figure 1. Distribution of the BDI scores.

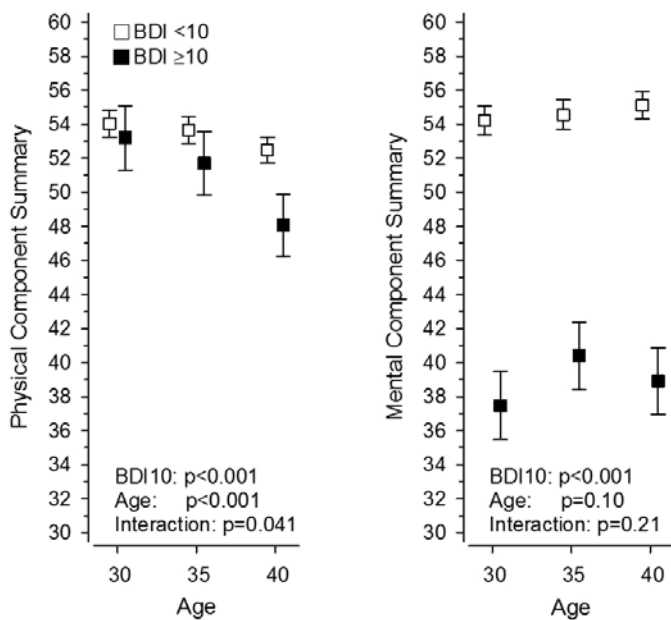


When the two groups (Dep+/Dep-) were compared to each other, statistically significant differences ($p < 0.001$) were detected when assessing the participants' employment and economic status, their level of physical activity, use of alcohol and working ability. The difference is especially notable when it comes to self-reported working ability in relation to the mental requirements for work: only 48% of Dep+ males considered their working ability as being adequate compared to 94% of Dep- males. The corresponding figures for the physical requirements for work were 67% vs. 90%. Dep+ males were more likely to be unemployed (13% vs. 5%) and to draw a disability pension (9% vs. 2%). Reported increased depressive symptoms in this study also suggest higher alcohol consumption and less physical activity (Table 1).

Table 1. Characteristics of the men who completed/responded to the questionnaire: means (SD).			
	BDI<10 (Dep-) N=794	BDI>=10 (Dep+) N=145	p-value
Cohort			
1969	259(33)	46(32)	
1974	249(32)	49(34)	
1979	286(36)	50(34)	0.76
Employment status			
Employed	714(90)	106(73)	
Student	22(3)	7(5)	
Unemployed	41(5)	19(13)	
Disability pension	13(2)	13(9)	<0.001
Economic status: self-reported sufficient income, N (%)	586(74)	65(44)	<0.001
IPAQ, mean(SD)	46(23)	33(23)	<0.001
Use of alcohol/12 months, N (%)	41(5)	18(12)	<0.001
<=12 units/week, N (%)	139(18)	49(34)	<0.001
No work-related disability reported, N (%)	566 (72)	57(39)	<0.001
Sufficient working ability regarding requirements for work*, N (%)			
Physical requirements	708 (90)	97 (67)	<0.001
Mental requirements	742 (94)	69 (48)	<0.001

Dep+ males reported lower HRQoL than Dep- males as measured by the SF-36. This result was patent for all eight subdomain scores. The difference was most obvious for the subdomains of energy/vitality, role limitations due to emotional problems, social functioning and mental health. PCS/MCS scores were also formed for both groups in each cohort. Significant reduction in the PCS score reported by the Dep+ group was detected only in the oldest cohort, whereas MCS scores of Dep+ males were significantly lower than those reported by Dep- males, irrespective of the cohort (Fig 2).

Figure 2. RAND-36 results among different age cohorts.



PCS: 30 $p = 0.53$, 35 $p = 0.14$, 40 $p = 0.003$, MCS 30 $p < 0.001$, 35 $p < 0.001$, 40 $p < 0.001$

Discussion

Key findings

The novel finding of the study is that even a modest increase in self-rated depressive symptoms associated significantly with the mental aspects of QoL in all cohorts. However, increases in the self-rated depressive symptoms that accompanied poorer physical QoL were present only in the oldest cohort. These results are consistent with those reported by Wells et al. (23) and Saarni et al. (4), which suggest that HRQoL is impaired among individuals suffering from depression or depressive symptoms. The latter result is in line with the findings of Surtees et al. (8) who suggested that depressive and anxiety disorders have a profound, independent impact on functional health of older (aged 40-74 years) men and women. In addition, our study shows that the effects of increased depressive symptoms, even mild symptoms, on the mental component of QoL are even more profound and can also be detected in younger cohorts.

The results suggest that males with increased depressive symptoms are more likely to be unemployed, lack economic resources and have work-related disability. The difference is especially notable when it comes to working ability in relation to the mental requirements for work, as only half of the males with increased depressive symptoms considered their working ability sufficient in this regard. Depressed males were more likely to be unemployed and to draw a disability pension. This is in line with previous studies that have shown depressive symptoms are more common among individuals in lower socioeconomic groups, and that more severe depressive symptoms or depressive disorders are associated with lower income (24,25,26). Previous qualitative and quantitative studies also support the data that depressive symptoms alter the affective and instrumental attitudes toward taking physical activity (27,28,29,30,31). The results of this study are well in line with these findings as the Dep+ males seemed to be physically less active than their Dep- counterparts. This is noteworthy because the anti-depressive benefits of physical activity are well evidenced: they can be equal to or sometimes stronger than cognitive behavioural therapy or medication (32,33).

Strengths and limitations

The strength of this study is that cohort comparisons allow the assessment of how increased depressive symptoms associate with the mental and physical components of QoL in different age groups. Depressive symptoms and quality of life were measured by validated, frequently used and commonly accepted instruments, which is also a strength. The low response rate is a clear limitation, and due to the cross-sectional nature of the study we cannot draw causal relationships. We had no data from the non-responders and thus we could not include any data from them in our analyses.

Conclusions

The results of the study suggest that even a modest increase in self-rated depressive symptoms can significantly affect the mental components of QoL in younger males, and that they can also significantly affect the physical components in an older cohort (men aged 40). The results also suggest that screening depressive symptoms in younger cohorts and paying attention to even modestly increased symptoms could be worthwhile, as these seem to associate with increased risk of major depressive episodes and chronic depression [34].

Declarations

The authors have no competing interests. The study was supported by Scientific Advisory Board for Defence, which is a wide-ranging scientific research and expert network that includes representation of universities, higher education institutions, research institutions, industry, the Defence Administration and other authorities responsible for the security and vital operations of society. The present study was conducted in this context.

References

1. Ferrari AJ, Somerville A, Baxter AJ, Norman RE, Patten SB, Vos T et al. Global variation in the prevalence and incidence of major depressive disorder: a systematic review of the epidemiological literature. *Psychol Med* 2013;43:471-481.
2. Carta MG, Carpiniello B, Kovess V, Porcedda R, Zedda A, Rudas N. Lifetime prevalence of major depression and dysthymia: results of a community survey in Sardinia. *Eur Neuropsychopharmacol* 1995;supplement: 103-107.
3. Markkula N, Suvisaari J, Saarni SI, Pirkola S, Pena S, Saarni S et al. Prevalence and correlates of major depressive disorder and dysthymia in an eleven-year follow-up - results from the Finnish Health 2011 Survey. *J Affect Disord* 2015;173:73-80.
4. Saarni SI, Härkänen T, Sintonen H, Suvisaari J, Koskinen S, Aromaa A et al. The impact of 29 chronic conditions on health-related quality of life: a general population survey in Finland using 15D and EQ-5D. *Qual Life Res* 2006;15:1403-1414.
5. Penninx BW, Geerlings SW, Deeg DJ, van Eijk JT, van Tilburg W, Beekman AT. Minor and major depression and the risk of death in older persons. *Arch Gen Psychiatry* 1999;56:889-895.
6. Schulz R, Beach SR, Ives DG, Martire LM, Ariyo AA, Kop WJ. Association between depression and mortality in older adults: the cardiovascular health study. *Arch Intern Med* 2000;160:1761-1768.
7. Myint PK, Luben RN, Surtees PG, Wainwright NWJ, Welch AA, Bingham SA et al. Self-reported mental health-related quality of life and mortality in men and women in the European prospective investigation into cancer (EPIC-Norfolk): a prospective population study. *Psychosom Med* 2007;69:410-414.
8. Surtees PG, Wainwright NWJ, Khaw K-T, Day NE. Functional health status, chronic medical conditions and disorders of mood. *Br J Psychiatry* 2003;183:299-303.
9. Cassano P, Fava M. Depression and public health an overview. *J Psychosom Res* 2002;53:849-857.
10. Koponen H, Kautiainen H, Leppänen E, Mäntyselkä P, Vanhala M. Cardiometabolic risk factors in patients referred to depression nurse case managers. *Nord J Psychiatry* 2015;69:262-267.
11. Henderson M, Hrveys SB, Øverland S, Mykletun A, Hotopf M. Work and common psychiatric disorders. *J R Soc Med* 2011;104:198-207.
12. Rosso AI, Gallagher RM, Luborsky M, Mossey JM. Depression and self-rated health are proximal predictors of sustained change in pain in independently living, community dwelling elders. *Pain Medicine* 2008;9:1035-1049.
13. Everson-Rose SA, House Sj, Mero RP. Depressive symptoms and mortality risk in a national sample: confounding effects of health status. *Psychosom Med* 2004;66:823-830.
14. Wolinsky FD, Culler SD, Callahan CM, Johnson RJ. Hospital resource consumption among older adults: a prospective analysis of episodes, length of stay, and charges over a seven-year period. *Journal of Gerontology: Social Sciences* 1994;49:S240-S252.
15. Idler EL and Kasl S. Self-ratings of health: do they also predict change in functional ability? *Journal of Gerontology: Social Sciences* 1995;50B(6):S344-S353.

16. Mossey JM and Shapiro E. Self-rated health: a predictor of mortality among the elderly. *Am J Public Health* 1982;72:800-808.
17. Benyamini Y and Idler EL. Community studies reporting association between self-rated health and mortality. *Research on Aging* 1999;21:392-401.
18. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry* 1961; 4: 561-571.
19. Brown N, Melville M, Gray D, Young T, Munro J, Skene AM et al. Quality of life four years after acute myocardial infarction: short form 36 scores compared with a normal population. *Heart* 1999;81:352-358.
20. Garratt A, Schmidt L, Mackintosh A, Fitzpatrick R. Quality of life measurement: bibliographic study of patient assessed health outcome measures. *BMJ* 2002;324:1417.
21. Ware JE, Kosinski M, Keller S. SF-36 Physical and Mental Health Summary Scales: a User's Manual, 2nd edition. Boston, MA: The Health Institute; 1994.
22. Hagströmer M, Oja P, Sjöström M. The International Physical Activity Questionnaire (IPAQ): a study of concurrent and construct validity. *Public Health Nutrition* 2006;9:755-62.
23. Wells KB, Stewart A, Hays RD, Burnam MA, Rogers W, Daniels M et al. The functioning and well-being of depressed patients results from the medical outcomes study. *JAMA* 1989;262:914-919.
24. Lorant V, Deliège D, Eaton W, Robert A, Philippot P, Ansseau M. Socioeconomic inequalities in depression. a meta-analysis. *Am J Epidemiol* 2003;157:98-112.
25. Bridges S, Disney R. Debt and depression. *Journal of Health Economics* 2010;29:388-403.
26. Elovainio M, Pulkki-Råback L, Jokela M, Kivimäki M, Hintsanen M, Hintsala T et al. Socioeconomic status and the development of depressive symptoms from childhood to adulthood: a longitudinal analysis across 27 years of follow-up in the Young Finns study. *Soc Sci Med* 2012;74:923-929.
27. Hemmis L, de Vries H, Vendelanotte C, Short CE, Duncan MJ, Burton NW et al. Depressive symptoms associated with psychological correlates of physical activity and perceived helpfulness of intervention features. *Mental Health and Physical Activity* 2015;9:16-23.
28. Seime RJ, Vickers KS. The challenges of treating depression with exercise: from evidence to practice. *Clin Psychol Sci Pract.* 2006;13:194-197.
29. Azar D, Ball K, Salmon J, Cleland VJ. Physical activity correlates in young women with depressive symptoms: a qualitative study. *Int J Behav Nutr Phys Act* 2010;7: 3.
30. Searle A, Calnan M, Lewis G, Campbell J, Taylor A, Turner K. Patients' views of physical activity as treatment for depression: a qualitative study. *Br J Gen Pract* 2011;61:149-156.
31. Pomp S, Fleig L, Schwarzer R, Lippke S. Depressive symptoms interfere with post-rehabilitation exercise: outcome expectancies and experience as mediators. *Psychology, Health & Medicine* 2012;17:698-708.
32. Babyak M, Blumenthal JA, Herman S, Khatri P, Doraiswamy M, Moore K et al. Exercise treatment for major depression: maintenance of therapeutic benefit at 10 months. *Psychosom Med* 2000;62:633-638.
33. Martinsen EW. Physical activity in the prevention and treatment of anxiety and depression. *Nord J Psychiatry* 2008;62:25-29.
34. Markkula N, Marola N, Nieminen T, Koskinen S, Saarni SI, Härkönen T, Suvisaari J. Predictors of new-onset depressive disorders - Results from the longitudinal Finnish Health 2011 Study. *J Affect Disord* 2017; 208: 255-264.

Eija Ohvanainen, MD
Psychiatry, University of Helsinki and Helsinki University Hospital

Hannu Kautiainen, MSc
Unit of Primary Health Care, University of Helsinki and Helsinki University Hospital

Ilkka Kiviranta, MD, professor
Orthopaedics and Traumatology, University of Helsinki and Helsinki University Hospital

Hannu Koponen, MD, professor
Psychiatry, University of Helsinki and Helsinki University Hospital

Correspondence:
hannu.j.koponen@hus.fi