



The relationship of modern health worries to depression, symptom reporting and quality of life in a general population survey

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ABSTRACT

Objective: Worries about the risk to personal health from new technology and features of modern life have been shown to be associated with the use of health care services, health behaviours, mood and reporting of physical symptoms. We examined the frequency and nature of these concerns in a large national sample and the relationship of modern health worries to demographic factors, depression, symptom reporting and health-related quality of life.

Methods: A representative sample of the German population (n = 2485) completed a face-to-face survey which included demographic information, the Modern Health Worries Scale, as well as measures of depression, symptom reporting, and health-related quality of life.

Results: The majority of the population reports high or extremely high concerns about aspects of modernity affecting their personal health, while only six percent reported no concerns at all. Higher levels of modern health worries were found in females but were not associated with income or age. Higher levels of modern health worries were significantly associated with depression, symptom reporting and lower health-related quality of life. We found the relationship between modern health worries and both symptom reporting and health-related quality of life was only partially explained by depression for most outcome variables, while the association between MHW and physical component (SF-12) was fully mediated by depression.

Conclusions: Concerns about aspects of modernity affecting health are common in a general population sample and associated with depression, symptom reporting and quality of life.

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Introduction

While objective indices of health have improved over the last few years, surveys show that people's subjective health perception has worsened [1] and many individuals feel that new technology, changes in food production and other aspects of modern life are a threat to their personal health [2]. Individuals with high levels of modern health worries are concerned about the health effects of such factors as pesticides in food, radiation from cell phone towers, environmental pollution and depletion of the ozone layer. These concerns have come to interest researchers as they seem to be associated with more symptom complaints, greater alternative medicine use, and poorer self-rated health [3–5].

There also seems to be a link between modern health worries (MHW) and somatic syndromes. Higher levels of modern health worries have been found to be associated with the most common somatization

disorder symptoms and somatosensory amplification [6] as well as in individuals with idiopathic environmental intolerance such as multiple chemical sensitivity and electromagnetic hypersensitivity syndromes [7]. Individuals with higher levels of modern health worries consume more alternative health care products [8,9] and organic food [9,10], but use less prescription medication, perhaps because they are wary of its harmful effects [4]. In this study we investigate modern health worries in a general population sample. We were specifically interested, firstly, in the prevalence of concerns about aspects of modernity affecting health. Secondly, we examined the relationship between the demographic factors of age, sex, education and income to modern health worries. Thirdly, we investigated the relationship between modern health worries and depression, symptom reporting and health related quality of life.

It is not clear whether the link between MHW and somatic symptoms is explained by rates of depression. Depression might cause both MHW and symptoms; in statistical terms, depression could fully mediate the association between MHW and physical health. Another option is that MHW causes depression, which in turn causes symptoms. While the second option requires longitudinal analyses, we have investigated the statistical mediation effect of depression on the link between MHW and health.

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Method

Participants

A total of 2524 people agreed to participate (response rate = 62.1%; see below), and 2485 of these completed all modern health worries items and are subsequently defined as the sample. The sample comprised 1182 (48%) males and 1303 (52%) females. This closely matches the German general population with just slightly less men and more women (men 49% and women 51% in the population) [11]. Also other variables correspond closely to the rates in the German general population (see Table 1).

Procedure

The study survey was carried out in May and June 2008 by ABM Consulting who randomly sampled respondents from the German population divided into 258 unit areas. Participants were included in this survey if they were older than 14 years and able to understand and read German. All households were visited by a study assistant, who informed participants about the investigation and data safety, and waited while participants completed the research questionnaires (for further details see [12]). The market research company conducting data sampling is member of a group with general ethical approval from the government to conduct these types of surveys. Such surveys need to comply with established and written ethical principles. A total of 2524 people agreed to participate and signed written informed consent forms.

Measures

Participants completed the following measures:

Modern Health Worries. The scale assesses how concerned respondents are about the impact of various aspects of modern life [3]. A 26 item version of the scale was used, with answer categories from 1 (*no concern*) to 5 (*extreme concern*). We adapted some items of the original scale because of translation issues and national characteristics. The items “pesticides” and “vaccination programs” were omitted, the items “contaminated water supply”, and “fluoridation of water” were merged into “poisoned drinking water”, the item “bacteria in air condition systems” was changed to “chemicals in air condition systems”, and four items (“radiation”, “other radiation sources in living spaces”, “moulds in living spaces”, “mad cow disease”) were added. Cronbach’s alpha for this scale was .97.

Patient Health Questionnaires. The PHQ-15 [13] was used to assess somatization and the PHQ-9 [14] was used to assess depression. The psychometric properties of these two scales are well established [15,16]. Cronbach alphas in this sample for the PHQ-15 and PHQ-9 were .79 and .88, respectively.

Short Form Health Survey (SF-12). This scale is a shorter version of the SF-36 questionnaire for use in large scale studies to measure health related quality of life [17]. The scale produces both a physical and mental functioning component summary score. The reliability and validity of the SF-12 have been well established [18].

Results

Only six percent ($n = 147$) of the population reported no modern health worries. A major proportion of the population was very concerned about a number of modern health worries scale items affecting their health (Fig. 1; Table 1). The highest concern was about the depletion of the ozone layer, but many of the other items generating high levels of concern for at least 20% of the population relate to modern changes to food production, such as genetically modified food, pesticides in food, hormones and antibiotics in food. The items that generate the lowest rates of concern are cell phones, radio or cell phone towers and high tension power lines.

Women (mean 58.46, SD 22.98) reported higher modern health worries than men (mean 54.66, SD 22.28), $t(2483) = 4.17$, $p < .001$. Age was not associated with modern health worries ($r = .04$, $p > .05$). There was a small effect in terms of more MHWs in people with low education levels, Brown-Forsyth $F(6, 369) = 2.73$, $p < .05$ and low income, $r = -.05$, $p < .05$.

To test whether depression mediated the relationship between modern health worries, somatic symptoms and quality of life, we ran a series of regression analyses controlling for gender, education and income. First, we established that modern health worries were associated with depression ($\beta = .18$, $p < .001$). Second, modern health worries were associated with somatic symptoms ($\beta = .20$, $p < .001$). Third, both depression ($\beta = .58$, $p < .001$) and modern health worries ($\beta = .10$, $p < .001$) predicted somatic symptoms, ($R^2 = .40$, $F(5, 2256) = 1280.56$, $p < .001$). This suggests that depression partially mediates the association between modern health worries and symptom reports. Modern health worries were associated with physical quality of life ($\beta = -.11$, $p < .001$). Only depression ($\beta = -.43$, $p < .001$) and not modern health worries ($\beta = -.03$, $p > .05$) predicted physical quality of life, ($R^2 = .29$, $F(5, 2326) = 186.41$, $p < .001$), suggesting that depression mediates the association between modern health worries and physical component quality of life. Modern health worries were associated with mental component quality of life ($\beta = -.23$, $p < .001$). Depression ($\beta = -.65$, $p < .001$) and modern health worries ($\beta = -.11$, $p < .001$) predicted mental component quality of life, ($R^2 = .47$, $F(5, 2326) = 418.03$, $p < .001$). Thus, depression partially mediates the relationship between modern health worries and the mental component of quality of life.

Discussion

The results of this large national sample show a significant proportion of the population report high or extremely high concerns about aspects of modernity affecting their personal health. Many concerns are about depletion of the ozone layer or about changes to food production that are seen to be a risk to health. Modern health worries are significantly associated with depression and somatic symptom complaints. Further analyses showed that the relationship between modern health worries and symptom reporting is only partially explained by depression. It is possible that other variables, such as increased bodily awareness as a result of MHW, provide better explanation for the association [19]. We also found that modern health worries were significantly associated with both mental and physical quality of life. We found depression fully mediated the relationship between modern health worries and the physical component of quality of life but it only partially mediated the relationship of modern health worries and the mental component of quality of life.

This study extends the findings of previous work in younger student samples [3,4,20]. Similar to earlier studies originating from other countries, the depletion of the ozone layer is the top item of concern. However, a significant section of the population seems to have major concerns in terms of environmental changes and worries about food production. The next five most frequently cited items (rankings 2 to 6) deal about potential toxic aspects of food. While Germany has one of the most visible anti-nuclear-energy movements, nuclear radiation was only ranked 10. The Eurobarometer survey using other methods confirmed that most Europeans are worried about chemical and changes to food production, and 46% reported concerns about electromagnetic fields. In this survey including 27 European countries, Germany usually scored in the medium range, with Italy higher, and The Netherlands and Scandinavian countries reporting

Table 1

Sample description.

N	2524
Age (only people above 13)	48.9 (SD 18)
Sex (%female)	52%
Education (% higher than elementary school)	55%
Monthly household income < 2000 Euros	57%
PHQ-15 somatic symptoms	3.37 (SD 3.7)
SF-12 physical	51.6 (SD 8.0)
SF-12 mental	55.4 (SD 8.4)
No MHW with at least substantial intensity	20%
1–5 MHWs (substantially [3] to extremely concerned [5])	23%
6–10 MHWs	17%
11–15 MHWs	14%
16 MHWs and above	26%

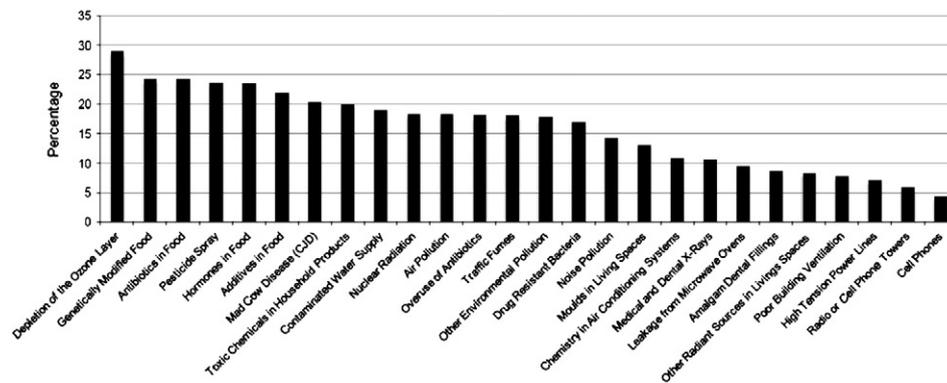


Fig. 1. Percentage of German population with “high” or “extremely high” concern about item causing effects on personal health.

less concerns [21]. However, despite variations in the ranking of individual items, modern health worries as a whole seem to be a stable construct.

Shortcomings of our study are the cross-sectional data collection, and the exclusive use of self-report data. Objective illness data would reveal further insight into our findings. Longitudinal data could extend our findings, e.g., using cross-lagged panel analyses. Moreover, after accidents like the one of Fukushima, the ranking of single concerns could change. The reference scores published in this article offer opportunities for analyzing future changes, e.g., after serious, society-relevant health threatening events. Despite the limitations mentioned above, our data further confirm that modern health worries represent a general construct with substantial health care relevance, and variables like depression do only partially mediate this association.

Conflict of interest

The authors declare no conflict of interest that could have influenced the content of this article.

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