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# Solidarity in the neighbourhood, social support at work and psychosomatic health problems

Daniel Bergh · Bengt Starrin · Curt Hagquist

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## Abstract

**Aims** The aim of this study was to analyse the link between psychosocial factors in the neighbourhood and work environments, and psychosomatic health problems.

**Methods** The data were collected in the survey “Life and Health”, which was conducted in 2000 in six Swedish county councils. A total of 71,580 questionnaires were distributed to randomly selected individuals aged 18–79. A total of 46,636 respondents completed the questionnaire. This gives a response rate of around 65%. For the purpose of this study only gainfully employed individuals aged 18–64 are included, which gives a total of 22,164 individuals: 11,247 (50.7%) women and 10,917 (49.3%) men. Two scales were used to measure the psychosocial environments in the neighbourhood and at work. The link between these scales and psychosomatic health problems was analysed by using multinomial logistic regression.

**Results** The results show that both “Psychosocial Neighbourhood Environment” (PNE) and “Psychosocial Working Environment” (PWE), independently, are related to psychosomatic health problems. Hence, the health effects of social relations in the neighbourhood were not modified by the quality of social relations at work, or vice versa. The levels of psychosomatic health problems are highest for people experiencing a low degree of social solidarity in the

neighbourhood and for those experiencing low degrees of supportive work relationships.

**Conclusion** The strong, but independent, effects of social factors related to the neighbourhood and to the workplace on psychosomatic health problems point to the importance of simultaneously considering social relations in different arenas in order to increase the knowledge of the connection between social relations and health.

**Keywords** Social relations · Social support · Neighbourhood · Workplace · Psychosomatic health complaints

## Introduction

Social relationship is a multifaceted concept that can be described as involving any type of social interaction that takes place between two or more individuals, during leisure time as well as working hours. The type, intensity and quality of social relationships are considered to have an impact on the well-being of the individual, physically and mentally.

A large number of studies on social relationships and health have been conducted during the last decades, in particular concerning social support. The classic Alameda County study (Berkman and Syme 1979) has influenced many of these studies. In recent years, a number of studies have been conducted confirming the link between social support and health, both psychiatric (Fuhrer et al. 1999) and general health (Melchior et al. 2003). In Sweden, research into the influence of social support on health started in the late 1970s, and since then, several theses have been published on this topic (Orth-Gomér 1979; Hanson 1988; Undén 1991; Östergren 1991; Lindström 2000). It has been

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shown that insufficient social relationships may increase the risks of both psychiatric ill health and mortality. A study of men born in Malmö in 1914 showed that the quality of the emotional support rather than just the access to social support affects nervous problems and insomnia (Hanson and Östergren 1987).

Secure and supportive social relationships are considered important resources that protect against psychiatric ill health (Kawachi and Berkman 2001). The mechanisms behind this have not been fully clarified, but it may be due to the positive effect that such relationships have on self-confidence and self-feelings. Individuals who receive support are also more likely to get help when needed, implying an increased feeling of security. It can also mean that an individual is less likely to be affected by stressful situations and that they find such situations easier to cope with (Berkman and Glass 2000). In the literature, two different complementary models have been introduced, describing the mechanisms behind the link between social relationships and health. One of them, the “main effect model”, describes how participation in social networks can affect an individual’s psychiatric health and assumes social relationships to always be beneficial to an individual, whether he/she is under stress or not. The other model, the “stress–buffering model”, assumes that the effect of social support is greatest among individuals experiencing strains and stresses. In the context of that model, social support is seen as a resource that contributes to alleviating and modifying the effects of different types of strains (Cobb 1976; Cohen and Wills 1985; Kawachi and Berkman 2001).

The perceived neighbourhood environment has proved to be of importance for health and wellbeing. A number of studies have demonstrated a link between an individual’s perception of their neighbourhood environment and health, psychiatric as well as self-reported general and physical health (Sooman and Macintyre 1995; Ellaway et al. 2001; McCulloch 2001). One important aspect of the neighbourhood environment is the feeling of solidarity. It has been shown that the stronger the feeling of belonging, and the more positive the experience of a neighbourhood environment, the lower the degree of ill health amongst its inhabitants (Ellaway et al. 2001).

There has been extensive research undertaken about the psychosocial environment in the workplace. There are two prominent models describing how psychosocial relationships affect health and well-being: the “demand control model” (Karasek and Theorell 1990) and the “effort reward imbalance model” (Siegrist 1996). The former model deals with demands and control at work. In that model, social relationships in the workplace usually play an inconspicuous role. In contrast, Johnson and colleagues added social support to the “demand-control model”. It is then assumed that individuals experiencing a low degree of social support

and, at the same time, high psychosocial demands and low control, compared to other individuals, are at a higher relative risk of cardiovascular disease (Johnson et al. 1996). A large number of studies have confirmed the connection between work-related social relationships and psychosocial health. Also psychiatric ill health has been shown to be linked to high demands in work, low control and social support in work (Paterniti et al. 2002).

In conclusion, many studies indicate that the quality of social relationships in the neighbourhood environment and in the work environment has an impact on the psychosocial well-being of an individual. However, the research seems to be focussed either on the neighbourhood environment or the working environment. To our knowledge, no study has focussed on these two different aspects of social relationships at the same time. To increase the knowledge about the connection between social relationships and health, it is necessary to simultaneously take into account social relationships in different spheres.

The purpose of this study is to analyse the link between social relations and psychosomatic health problems using measures of the Psychosocial Neighbourhood Environment (PNE) and Psychosocial Working Environment (PWE) as independent variables, and a measure of psychosomatic health problems (PSH) as dependent variable.

## Methods

### Population and sampling procedures

This study is based on the survey “Life and Health”, which was conducted in 2000. A total of 71,580 questionnaires were distributed to randomly selected individuals aged 18–79, living in 58 municipalities (six county councils) across central Sweden. A total of 46,636 participants completed the questionnaire. This gives a response rate of around 65%. The questionnaire contained questions about health, social relationships, working conditions, living habits and quality of life. In accordance with the purpose of the study, only gainfully employed individuals aged 18–64 were selected. This resulted in an actual survey group consisting of 22,164 individuals. Due to non-responses on individual items comprising the psychosomatic health scale, 22,059 respondents were included in the analysis.

### Operationalisation and scale construction

#### *Psychosocial neighbourhood environment*

In this study, the individuals’ experiences of the Psychosocial Neighbourhood Environment (PNE) were analysed with a composite measure based on the summation of the

respondents' answers to the following statements: "you can trust the people who live in this area"; "the people in this area do not care very much about each other"; "the people in this area will act together if their common environment or security comes under threat"; "the people in this area know each other very well". The response alternatives were: "strongly agree", "partly agree", "partly disagree" and "strongly disagree".

#### *Psychosocial work environment*

"Psychosocial Work Environment" (PWE) was analysed with a composite measure based on the summation of the respondents' answers to the following statements: "I receive support from my boss when solving problems"; "I receive support from my colleagues when solving problems"; "My boss shows appreciation for a job done"; "There is a good sense of solidarity between work colleagues". The response alternatives were: "Strongly agree", "partly agree", "partly disagree" and "strongly disagree".

#### *Psychosomatic health*

Psychosomatic health (PSH) problems were analysed using a composite measure based on the summation of the respondents' answers to six items. The items included were: Have you during the last 3 months experienced one or more of the following symptoms: "pain in the back or hips", "pain in hands, arms, legs, knees or feet", "pain in stomach", "anxiety and worry", "sleeping difficulties" and "depression". The response alternatives were: "have not experienced this", "on one or two occasions", "on a number of occasions" and "practically all the time".

#### *Social background*

Out of the 22,164 individuals included in this study, 51% were women and 49% were men. The sample comprised five age groups: 18–24 years (5%), 25–34 years (18%), 35–44 year (24%), 45–54 years (30%) and 55–64 years (23%). As regards socioeconomic position, unskilled workers and middle-ranking salaried employees are the two biggest groups, making up half of the surveyed group, as they represent 25% each of the people in the study. Lower-ranking salaried employees (15%) and upper-ranking salaried employees (15%) are the two smallest groups in this respect (not shown in a table).

#### *Data analysis*

The psychometric properties of the PNE, PWE and PSH scales were examined using the Rasch model (Rasch 1960/1980). Since the property of invariance of measurement

comprises an integral part of the Rasch model, it is possible to test if the items work invariantly across different classifications of individuals that are to be compared (Andrich 1988). This means that if the data conform to the Rasch model, the use of person measures based on the summation of the raw scores across items is justified. RUMM2020 was used for the Rasch analysis (Andrich et al. 2004). For an introductory presentation of applications of the Rasch model in health research, see Hagquist (2001).

Given that the data fit the model, the Rasch model transforms the non-linear raw scores to person values on a linear interval logit scale. These "Rasch scores" were used in the present analysis of the PNE, PWE and PSH scales. As regards the PNE scale, a low score means a high degree of social solidarity (in the neighbourhood), whereas a high score implies a low degree of social solidarity. In the PWE scale, a low score implies a high degree of supportive social relationships (at work) and a high score low degree of supportive social relationships. In the analysis, the PNE and PWE scales were used as continuous interval scales. Regarding the PSH scale, a low score implies few psychosomatic health problems and a high score more problems. In the analysis, for the purposes of this study, the PSH scale was divided into three categories, based on the percentile values. Respondents at and below the 20th percentile constitute the category "lower levels", individuals above 20th but below the 80th percentiles "moderate levels" and individuals at and above percentile 80 the category "higher levels".

Differences in the prevalence of psychosomatic health problems between individuals with different social backgrounds were analysed using contingency tables. The differences between proportions were statistically tested using two-tailed z-tests (not shown in a table). Multinomial logistic regression was used in order to study the associations between, on the one hand, the psychosocial neighbourhood environment (PNE) and work environment (PWE) and, on the other hand, psychosomatic health (PSH) problems. Main effect models were chosen for the analysis because the inclusion of any interaction terms (i.e., PNE\*sex, PWE\*sex, PNE\*PWE) did not improve the fit.

## **Results**

### *Analysis of PNE, PWE and PSH*

The Rasch analysis of the composite measures of PNE, PWE and PSH shows that the data as a whole fit the Rasch model in an acceptable way, i.e., the items in all measures show relative invariance. The Cronbach's alpha analogous, the person separation index, is good for both the PNE and the PWE (0.729 and 0.775 respectively) as well as for PSH (0.7). All three composite measures also meet the criterion

of proper empirical ordering of the data, i.e., there are no reversed item thresholds. (Results in detail from the Rasch analysis are reported in a working paper, which is available on request from the first author).

### Social background and health

As shown in Table 1, the levels of psychosomatic health problems vary with social background. As regards sex, the proportion of men is significantly greater in the category “lower levels”, whereas the proportion women is greater in the “higher level” category (two-tailed z-tests,  $p < 0.05$ , not shown in table).

Despite small differences, there is a clear association between age and psychosomatic health problems. For instance, in the age group 55–64 the proportion pertaining to the “higher level” category is significantly greater than for the age groups 25–34 and 35–44. Similarly, the proportion in the “higher level” category among the 45–54-year group is significantly greater than for the 25–34 age group. The proportion pertaining to the category “moderate levels” is significantly greater in the age group 25–34 compared to the 45–54 and 55–64 groups (two-tailed z-tests,  $p < 0.05$ , not shown in table).

The connection between socioeconomic position and psychosomatic health problems is relatively clear. For instance, among the upper-ranking salaried employees the proportion pertaining to the “lower level” category is significantly greater than among all other socioeconomic groups. Also, among the unskilled workers the proportion

pertaining to the “higher level” category is significantly greater than among all other socioeconomic groups except lower-ranking salaried employees (two-tailed z-tests,  $p < 0.05$ , not shown in table).

### Psychosocial neighbourhood environment, psychosocial working environment and psychosomatic health

The connection between the PNE, PWE and psychosomatic health problems was analysed using multinomial logistic regression with adjustments for sex, age and socioeconomic position, which is shown in Table 2. The results of the analysis of model A implies that for every unit change on the PNE scale, the log odds for falling into the “higher level” category versus “lower level” category at the PSH scale increases by 0.278. To illustrate, the log odds for a person located at the 90th percentile (low degree of social solidarity) compared to one located at the 10th percentile (high degree of social solidarity) increases by 0.998, which means an odds ratio of 2.71. As regards model B, for every unit change on the PWE scale, the log odds for experiencing higher levels of psychosomatic health problems versus lower levels increases by 0.510. Again, for illustrative purposes, the log odds for a person located at the 90th percentile (low degree of supportive relations) compared to one located at the 10th percentile (high degree of supportive relations) increases by 1.515 on the logit scale, which means an odds ratio of 4.55. A slight decrease in effects of PNE and PWE occurs when the scales are analysed simultaneously (model C).

**Table 1** Social background and psychosomatic health problems (n=22,059)

	Lower levels (p 0–20)		Moderate levels (p 21–79)		Higher levels (p 80–100)	
	Number	%	Number	%	Number	%
<b>Sex</b>						
Female	1,674	14.9	7,042	62.8	2,494	22.2
Male	2,665	24.6	6,801	62.7	1,383	12.7
<b>Age</b>						
18–24	200	18.2	708	64.3	193	17.5
25–34	790	19.7	2,630	65.6	592	14.8
35–44	1,042	19.6	3,385	63.7	890	16.7
45–54	1,285	19.5	4,088	61.9	1,232	18.7
55–64	1,022	20.3	3,032	60.4	970	19.3
<b>Socioeconomic position</b>						
Unskilled workers	907	17.8	3,153	61.7	1,049	20.5
Skilled workers	721	17.1	2,749	65.2	744	17.7
Lower-ranking salaried employees	563	18.5	1,871	61.6	603	19.9
Middle-ranking salaried employees	1,100	21.2	3,238	62.4	855	16.5
Upper-ranking salaried employees	814	25.2	2,024	62.6	393	12.2

**Table 2** Multinomial logistic regression of psychosomatic health problems [“higher levels” (p80) versus “lower levels” (p20), n=22,059]

Variables	Model A		Model B		Model C	
	B	Odds ratio (95% CI)	B	Odds ratio (95% CI)	B	Odds ratio (95% CI)
PNE	0.278	1.32 (1.28–1.37) ***			0.203	1.23 (1.18–1.27) ***
PWE			0.510	1.67 (1.60–1.74) ***	0.487	1.63 (1.56–1.70) ***

Notes: Model A = the PNE scale separate; model B = the PWE scale separate; model C = analysis conducted with the PNE and PWE scales entered into the same regression model. In all models adjustments for sex, age and socioeconomic position were conducted.

\*\*\* $p < 0.01$

## Discussion

In the theoretical frame of reference for this study, the neighbourhood environment and the working environment are assumed to be two important social spheres where people interact. These two arenas for social relations are also considered as relevant for the health of individuals. It is evident that the research has been focussed on either social relationships in the neighbourhood or on those relationships taking place at work. The present study adds to the previous research by simultaneously analysing different aspects of social relations.

The results from the study show a connection between social relations (at work and in the neighbourhood) and psychosomatic health problems. The levels of psychosomatic health problems vary significantly with the degree of solidarity in the neighbourhood and the degree of supportive relationships in the working environment. The lower the degree of solidarity in the neighbourhood and the less supportive the relationships are in the working environment, the higher the levels of psychosomatic health problems.

The odds for experiencing high levels of psychosomatic health problems increases as the degree of solidarity in the neighbourhood environment lessens and the relationships in the work environment become less supportive. The odds for falling into the “higher level” category of the PSH scale is higher for persons with a lower degree of social solidarity in the neighbourhood compared to persons with a higher degree social solidarity. In a similar way, in the PWE scale, the odds for falling into the “higher level” category of the PSH scale is greater for persons with a lower degree of supportive work relationships compared to persons with a higher degree of supportive work relationships.

What those mechanisms are that operate behind the link between supportive social relationships and poor health has not yet been sufficiently proven. However, many studies suggest that it might be due to a positive impact of such

relationships on self-confidence and self-feelings, that in turn is beneficial to health (Thoits 1995; Turner and Turner 2006). Berkman and Glass (2000) argue that the positive impact that social support has on the psychological well-being has to do with, amongst other things, its effect on emotions. It has also been argued that emotional factors may mediate the relationship between social relations and health (Gallo and Matthews 2003). Emotions convey an individual’s reaction to events, in particular when the event is of great importance (Kubzansky and Kawachi 2000). Shame is considered to be the emotion that signals threats to the social bonds (Scheff 1990). It has been suggested that shame, when suppressed and unacknowledged, is one of the most powerful sources of chronic stress that is responsible for increasing people’s vulnerability to psychiatric ill health and also to a wide range of infectious and cardiovascular diseases (Scheff 1992, 2001; Wilkinson 2002; Dickerson et al. 2004). Chronic stress has also been suggested to affect the muscular system and hormonal regulation, and is thereby contributing to experiences of psychosomatic pain problems (Östberg et al. 2006) among Swedish school children, and can conceivably be applicable also to an adult population. In this study, social relationships in an individual’s neighbourhood environment and place of work are considered to be of central importance, not least because a large amount of a person’s time is spent in these environments. One possible interpretation of the results reported in this study would be that shortcomings in social relationships contribute to negative emotions and psychosocial stress, which in turn may contribute to experiences of psychosomatic health problems. It then follows that experiences of a low level of solidarity in the neighbourhood environment or a low degree of supportive work relationships may contribute to an increased risk of higher levels of psychosomatic health problems.

One interesting question is *how* social relations in the neighbourhood and in the workplace affect psychosomatic

health. Lazarus (1999) has argued that relationships in the context of the workplace and in other environments cannot be understood in isolation from each other. They are instead parts of a larger context where the parts have to be understood in relation to each other. The effects of social relationships in a work setting can therefore have consequences also for relationships in the home environment, and vice versa (Thoits 1995; Stansfeld 1999; Turner and Turner 2006). The analysis conducted in this study does not suggest any statistically significant interaction effects with respect to psychosomatic health problems. This means that the health effects of social relations in the neighbourhood are not modified by the quality of the social relations at work, or vice versa. Instead, social relations in both spheres show independent connections to psychosomatic health problems. The independent contributions from the work and neighbourhood environments respectively indicate room for actions in different arenas in order to improve health by elaborating the social relations among individuals. This is an important conclusion since the quality of the social relations among the individuals commonly differs between different environments. The results from this study, therefore, stress the importance of the simultaneous consideration of social relations in different spheres in order to increase the knowledge of the connection between social relations and health. This also points to the complexity of the association between social relations and health, implying that social relations on different arenas may be intertwined.

The perspective underpinning this paper has much in common with the public health debate on the importance of social capital for health and well-being. Usually, social capital is defined as the social resources (trust, norms of reciprocity and membership in voluntary associations) available to individuals in groups or communities, and where cohesive societies generally are seen to be enriched with social capital (Kawachi and Berkman 2000). Following this definition, social capital is conceptualised as a group attribute rather than an individual attribute. In this view, social capital is commonly considered as an extension of social relationships, particularly since social capital captures the structure of social relations. However, during the last few years more individual notions of social capital have received increased attention. Social capital in this view is interpreted as the social resources (for instance social support) embedded within an individual's social networks (Kawachi et al. 2008). The structure of network bonds can influence health in several ways, but social support is seen as a key pathway. Thus, social networks can be considered as a mediator between the macro and the micro social forms (Berkman and Glass 2000).

Finally, some methodological remarks are in order. Since the study design is cross-sectional, it is hard to determine

the direction of the relationships shown between social relations and psychosomatic health problems. It may be that poor social relations causes poor health, but it cannot be ruled out that individuals with psychosomatic health problems are more isolated or have social relations of lower quality because of their health problems [see Halpern (2005) and Turner and Turner (2006) for a discussion].

**Conflict of interest statement** The authors confirm that there are no relevant associations that might pose a conflict of interest.

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