Short reports

Operationalisation of a demand/resource model of health: an explorative study

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Exchange processes between people and their environment are assumed to be essential for health. Mussmann *et al*[1] define health as follows: "Health is a transactionally produced condition of a dynamic balance between the individual, his/her autonomous potential of self-organisation as well as of self-restoration and his/her social and economic environment. This balance depends upon the availability and use of health-protective and health-restoring factors in the individual and in the environment that can be defined as internal and external resources" (page 9). These resources are essential in coping with strain.

Antonovsky[2] suggested a salutogenic model that tries to answer the question how people can stay healthy despite the universal presence of stressors and demands. Antonovsky considers a general orientation guiding health related actions, called sense of coherence (SOC), as a necessary condition for positive health. He believes that in the SOC he found a personal/internal resource allowing people to cope with the most different forms of strain and nevertheless stay healthy. Therefore, Antonovsky's SOC represents a major element of our framework, beside social, demographic and economic factors, health behaviour, internal and external resources.

The aim of this study was to analyse the associations between self reported ill health and subjectively perceived external resources, internal resources—the SOC in particular—as well as health behaviour, controlling for socioeconomic variables such as age, sex, and educational level.

Methods

SUBJECTS

An interview survey was conducted in four rural communities in Styria (Austria). Selection of target persons was carried out by means of a two stage random sampling on the basis of addresses of the population aged over 19 years and living in the four communities. In each community, households were selected by random sampling. Selected households were contacted by phone to arrange a date and at the same time a further random selection took place via a predetermined rotation system to be carried out by the interviewer for potential interviewees aged 20 to 70 years. The process thus included both random selection of households and subsequent random rotation. Calls in non-answering households were repeated at least four times. When this procedure failed a new household was selected. Additionally, interviews were announced in writing. (Selected output addresses: 762; not at home, no answer: 71; refusers: 57). Data of 634 people were collected by trained interviewers using a structured face to face interview. (Sociodemographic characteristics: 54% female; age in years: 20–40: 36%, 41–60: 45%, 61–70: 19%; living in life companionship: 75% yes, 25% no; occupational class: self employed: 6%, white collar worker: 25%, blue collar worker: 35%, farmer: 14%, housewife: 20%)

Five main constructs of assessed variables were set up:

SELF REPORTED ILL HEALTH

Quality of life (QoL) was operationalised using the Munich Quality of Life Dimension List MLDL.[3] This scale measures physical QoL (2 items, Cronbach α=0.83) and psychological QoL (5 items, α=0.82). Perceived complaints were assessed by 12 frequent complaints that accounted for general, heart, muscles, and skeleton complaints. We calculated a general indicator for all 12 items (α=0.83). Furthermore we surveyed the presence of different chronic conditions (sum index).

HEALTH BEHAVIOUR

The dimension of alcohol consumption was set up as a sum index, for example, frequency of alcohol intake by summing up glasses of beer, wine etc, cigarette smoking (number of cigarettes a day), and physical exercise (5 point rating scale) as single items.

INTERNAL RESOURCES/DEMANDS

The SOC was studied using the SOC scale (short version, 13 items, α=0.83).[2] The Bradburn scale of affect balance measures perceived emotional state and can be thought to represent another internal resource of health (5 items, α=0.75).[4]

EXTERNAL RESOURCES/DEMANDS

We generated a social network indicator by questioning for formally and objectively assessable variables of relational systems, for example, the number of people giving practical support

*Table 1 Results of regression analyses**

	Psychological quality of life			Physical quality of life			Complaints			Chronic conditions		
	B	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*
Health behaviour												
Cigarette smoking	0.003	0.009	0.743	−0.009	0.006	0.135	0.002	0.026	0.931	0.003	0.003	0.320
Physical exercise	0.143	0.071	0.046	0.118	0.045	0.009	0.153	0.207	0.461	0.017	0.025	0.490
Alcohol consumption	−0.027	0.035	0.447	0.009	0.023	0.700	0.054	0.103	0.603	0.008	0.012	0.541
Internal resources												
Sense of Coherence	0.111	0.009	0.000	0.041	0.005	0.000	−0.238	0.025	0.000	−0.015	0.003	0.000
Affect balance	0.392	0.045	0.000	0.191	0.028	0.000	−0.669	0.129	0.000	0.007	0.015	0.640
External resources												
Economic situation	0.564	0.181	0.002	−0.056	0.115	0.624	0.685	0.524	0.191	−0.022	0.063	0.729
Social networks	−0.042	0.037	0.253	−0.049	0.024	0.038	0.411	0.107	0.000	0.006	0.013	0.666
	r^2 =	F =	p =	r^2 =	F=	p =	r^2 =	F=	p =	r^2 =	F =	p =
	0.448	49.68	0.0000	0.318	28.18	0.0000	0.288	24.38	0.000	0.178	12.78	0.0000

*Controlled for age, sex, and educational level.

(3 items, α=0.73). In addition, probands judged their economic situation on a three point rating scale.

SOCIODEMOGRAPHIC DATA

In our survey the usual sociodemographic characteristics of age, sex, and educational level were used.

The constructs of health behaviour, internal and external resources were analysed in relation to each ill health indicator (psychological and physical QoL, perceived complaints, chronic conditions) using multiple linear regression. Missing values were excluded pairwise.

Results

A high amount of physical exercise is related to high psychological QoL as well as to good physical QoL. The SOC results in positive associations with psychological and physical QoL, and in negative associations with perceived complaints and, interestingly, also with chronic conditions. The variable of SOC is significantly related to all four health outcome measures whereas a high degree of affect balance is relevant for good psychological and physical QoL as well as for a low rate of perceived complaints. A good economic situation is associated with high psychological QoL. Good social networks are related to poorer physical QoL and a higher degree of complaints (table 1).

Discussion

As population health research involves associations of many complex levels and types of influences affecting health, its soundness is widely determined by the range of theories and methods being used. A look at the results enables us to discern the function of health behaviour, of internal and external resources/demands on self reported health outcomes. It can be stated that health behaviour indicators have only marginal impact on self reported ill health. We consider the variables of SOC and affect balance as important factors. It has been possible to confirm that the individual's degree of SOC plays a key part in health outcomes. Social networks are inversely related to physical QoL and positively related to complaints. This might be because of the situation that persons in need get more help from their environment. The results of this explorative study have led us to support a demand/resource model as a fitting general framework of health. However, these results also reflect problems of causal modelling in population health research. Multivariate modelling departs from the view that causal relations can be revealed. However, the application of multivariate methods implicates problems of use and interpretation. Although this study was not able to reveal causal relations it is able to demonstrate the relevance of multilevel associations within population health research.[5] We consider these results as an important preliminary contribution to the understanding and modelling of how subjective well being is formed.

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2 Antonovsky A. *Unraveling the mystery of health. How people manage stress and stay well*. San Francisco: Jossey-Bass Publishers, 1987.
3 Bullinger M, Ludwig M, Steinbüchel N. *Lebensqualität bei kardiovaskulären Erkrankungen. Grundlagen, Meßverfahren und Ergebnisse*. Göttingen: Hogrefe, 1991.
4 Badura B, Kaufhold G, Lehmann H, *et al.* Subjektives Wohlbefinden nach Bradburn. In: Badura B, Kaufhold G, Lehmann H, *et al*, eds. *Leben mit dem Herzinfarkt*. Berlin: Springer, 1987:348–9.
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