REVIEW

Antonovsky's sense of coherence scale and its relation with quality of life: a systematic review

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The aim of this paper is to synthesise findings on the salutogenic concept, sense of coherence (SOC), and its correlation with quality of life (QoL). This study is descriptive and analytic, with a systematic integration of the contemporary knowledge base on the salutogenic research published in 1992–2003. This review includes 458 scientific publications and 13 doctoral theses on salutogenesis. In all, 32 papers had the main objective of investigating the relationship between SOC and QoL. This study is based on scientific publications in eight authorised databases, doctoral theses and available books. The SOC seems to have an impact on the QoL; the stronger the SOC, the better the QoL. Furthermore, longitudinal studies confirm the predictive validity of the SOC for a good QoL. The findings correspond to the core of the Ottawa Charter—that is, the process of enabling people to live a good life. Therefore, a certain possibility to modify and extend the health construct is becoming discernible, implicating a construct including salutogenesis and QoL. The SOC concept is a health resource, influencing QoL.

The revelation of the grave insults to human life in World War II made it pertinent to provide conditions conducive to the development of a global community guided by the protection of human rights. For public health, this meant the creation of the World Health Organization (WHO).[1] The WHO defines health not only as the absence of disease but also as a state of complete physical, mental, social and spiritual well-being.[2] Health is seen not only as a resource for everyday life but also as an important dimension of QoL. This means that reviewing research on QoL becomes relevant for public health and in health promotion.

In 1974, Lalonde[3 4] presented new perspectives on the health of Canadians, arguing that health is created by complex relations between the individual and the society. He stated that the biomedical model was too limited to explain health. At the same time, Aaron Antonovsky[5] introduced the concepts sense of coherence (SOC) and general resistance resources (GRRs), claiming that peoples' life orientation will have an impact on health. Almost 30 years have passed since the introduction of the salutogenic model of health. Antonovsky summarised the findings of the research undertaken up to 1991. Subsequently, nobody else has summarised the research. Therefore, it is important to gain coherent knowledge about the findings on the salutogenic research and how this concept contributes to a positive development of health and QoL. From this perspective, a systematic review on salutogenesis is adequate and useful for health promotion. Such a review is undertaken in the present work. Papers dealing with the background of salutogenesis,[6] its key theoretical concepts,[7] the validity of the SOC scale,[8 9] its relationship with health,[10] salutogenesis in the context of public health development[11] and a discussion of the SOC construct at a societal level[12] have been published.

In 1986, the first international conference on health promotion was held in Ottawa, Canada.[13] According to the Ottawa Charter, health promotion is the process of enabling the individuals to increase control over and to improve their health in order to reach a state of complete physical, mental and social well-being and to lead an active and productive life—that is, a good quality of life (QoL).[13] This means that individuals must be able to identify and realise aspirations, as well as to satisfy needs and cope with their environment. The ability to manage stress in a global world, characterised by rapid social changes, is crucial for the maintenance and development of health and QoL. This process provides not only adjustment to stress but also a flexibility and ability to identify and use the GRRs. The salutogenic framework could serve as a stress-resisting resource, providing prerequisites for a good life. An additional advantage is in responding to what the US Institute of Medicine sees as one of the most pertinent needs for the future education of health professionals in the 21st century: the necessity of finding a coherent health concept. The salutogenic model could serve such a purpose.[14]

THE SALUTOGENIC CONCEPT

Antonovsky tried to find the solution to the salutogenic question why some people, regardless of major stressful situations and severe hardships, stay healthy, while others do not. How do people manage their inability to control their life? The answer was formulated in terms of SOC and GRRs. The SOC refers to an enduring attitude and measures how people view life and, in stressful situations, identify and use their GRRs to maintain and develop their health. The SOC consists of at least three dimensions: comprehensibility, manageability and meaningfulness. The GRRs are, for example, money, intelligence, self-esteem,

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Abbreviations: GRR, general resistance resource; QoL, quality of life; SOC, sense of coherence

preventive health orientation, social support and cultural capital. People with these kinds of resources at their disposal have better chance to deal with the challenges of life.

THE CONCEPT OF QOL

The concept of QoL is complex, and there exists no universally accepted definition. There is a general agreement that the concept is multidimensional and the complexity is problematic to capture.[15–18] QoL can be viewed from various sciences such as philosophy (good life), sociology (intangible welfare and well-being), economy (economic standard), behavioural science (well-being) and medicine (normality).[19 20]

QoL has been defined as personal well-being or satisfaction with life,[15] as well as physical and material well-being, relations with other people, social, communal, civic activities, personal development and fulfilment,[21] positive mental health,[22] a degree of goodness,[16] and is related to health (HRQOL). Functional status, often actually functional limitations, and health are two dimensions of HRQOL. Both QoL and health are complex concepts. The concept of HRQOL is frequently used interchangeably with the QoL construct.[17] The definition of QoL by the WHO QoL Assessment Group captures physical and mental health in terms of positive aspects of health like coping, resilience, satisfaction and autonomy.[22]

A salutogenic interpretation of the QoL concept combines the global, external, interpersonal and personal resources of an individual, group or society.[19 20] These four dimensions form a holistic definition of the QoL based on the salutogenic theory as follows: ''QoL is the total existence of an individual, a group or a society describing the essence of existence as measured objectively and perceived subjectively by the individual, group or society.''[20] This model is consistent with WHO approaches to health promotion, and is appropriate for health service evaluation.[23]

The frequently used concepts of well-being, welfare, wellness, happiness and life satisfaction are all constructs closely related to QoL, but still theoretically distinct from this concept. These concepts require a separate review. In order to create coherence and crystallise the relationship between QoL and SOC, other similar concepts are excluded from this paper.

The aims of this paper are (1) to add new knowledge about SOC and its relationship with QoL, in addition to the evidence related to health; and (2) to relate the findings to the core of the Ottawa Charter for health promotion.

METHOD

This review, a research synthesis according to Cooper,[24] presents the state of knowledge on the salutogenic concept from 1992–2003. There are two explanations for the choice of the time period. First, this review is a continuation of the work carried out by Antonovsky up to 1991.[8] Second, although the review will continue in the future, it is time-limited here because it is part of a doctoral thesis that started in 2003. The review is systematic in the sense that all included papers have been critically examined by the first author, according to a set of criteria (see below). The papers were analysed according to the following dimensions: (1) the study objective (as the exploration of how SOC can affect health as a dependent and an independent variable, the examination of the predicting value of the SOC); (2) the study designs and methods for analysis (multiple methods and multiple levels of analysis); (3) conceptual description of the concept of QoL (do the authors identify what they conceptualise as QoL); (4) reasons for choosing a particular measure of QoL; and (5) the applicability and practical use of the results.

An approach using regression techniques for the analysis is more useful than that using correlations only.[15] There are several studies supporting a significant relationship between SOC and QoL. However, this kind of notion gives only a limited but not sufficient evidence. The effect sizes of the correlation applied in this review follow the Cohen's recommendation for behavioural sciences.[25] The effect size $r = 0.10$ is considered small, $r = 0.30$ medium and $r = 0.50$ large. Furthermore, the ability of the SOC questionnaire to predict QoL is presented. In addition, studies whose findings failed to support an effect on QoL are shown.

The interpretation of causality is somewhat problematic. A correct conclusion of the study results requires a careful step-by-step analysis of the study design.[26] Some of the techniques can give us a clue regarding the effects on QoL. By using hierarchical regression analyses, the main effect on QoL can be estimated. A significant increment in r^2 detected in the final step of the regression model, indicates a direct effect of the SOC on the QoL outcome.[25] A moderator is a variable that affects the direction and/or strength of the relationship between an independent and a dependent variable.[27] A variable functions as a mediator when it accounts for the relationship between the independent and dependent variables.[27] Structural equation modelling is a method used for the estimation of causality.[28] Longitudinal and cross-sectional studies are analysed here separately, and so are the quantitative and qualitative studies.

Limitations of the research synthesis

The lack of a common and consensual definition of QoL makes it somewhat complicated to interpret and conclude the findings. However, this is a general issue in research and not limited to the salutogenic theory. QoL was measured by standardised and validated questionnaires, as well as the original SOC scales. This makes the results as adequate as possible. A parallel can be drawn to the difficulties involved in defining the health concept. Many different ways of measuring health exist. However, most of the questionnaires measure risks, symptoms of diseases or ill health (eg, the Nottingham Health Profile, the Sickness Impact Profile, Health Index). In such studies, health is defined negatively and a pathogenic approach is adopted.[15–17] In addition, the results from cross-sectional studies using only correlations for the analysis are limited. The findings do not answer the questions about causality. Longitudinal studies are needed for this purpose.

Inclusion and exclusion criteria

The inclusion criteria are: (1) papers dealing with the SOC concept and/or using some of the different versions of the SOC questionnaire published in scientific peer-reviewed journals. Further, for this paper, studies aiming to assess QoL and relate the results to the SOC; (2) peer-reviewed papers and doctoral theses; (3) quantitative and qualitative studies with equal weights to the method used; (4) papers in English, Finnish, Danish, Norwegian or Swedish; (5) papers with a careful description of the translation process to languages other than English; (6) quantitative studies with an acceptable reliability and validity (face, consensual, construct, criterion, predictive and responsiveness); and (7) publications in the time span 1992–2003.

The exclusion criteria are: (1) papers not using Antonovsky's Life Orientation Questionnaire (SOC) for measuring coherence; (2) papers in languages other than those mentioned before (ie, French, German, Japanese and Polish); (3) double published papers (included only once); (4) papers without references to Antonovsky's SOC concept (primary or secondary references); (5) papers afflicted with weakness in power—that is, response rate $<50\%$, without a careful analysis of dropouts (after request of completing information from the authors without an answer); (6) papers afflicted with insufficient validity of the SOC scale (ie, dealing only with one or two dimensions of the

concept); and (7) publications at master of science level or lower (ie, dissertations).

Search strategy

The following search strategy has been performed: (1) electronic search in the databases PubMed (Medline), Bibsys, ISI, Libris, PsychInfo, Cinahl, Social Services Abstracts and Sociological Abstracts; (2) search on the key words salutogenesis, salutogenic, sense of coherence and the Swedish and Finnish translations; (3) reviewing reference lists in the identified papers; and (4) personal communication with the authors and colleagues.

Material and procedure

The description of the material is presented in a flow chart (see Eriksson and Lindström,[9] appendix table 1). After adjustment for double listing in the databases and doctoral thesis, 458 hits met the inclusion criteria (as of 31 December 2003). This review is based on these articles and 13 doctoral theses (see Eriksson and Lindström,[9] appendix tables 9 and 10). From the total of 458 articles, 32 papers were eligible for review, based on their main purpose, the relationship between QoL and the SOC. A detailed protocol was compiled for each article or doctoral thesis. The assessment of the included papers is described in detail elsewhere.[9]

It was not possible to carry out a full meta-analysis, mainly because of the diversity in the base material, the variations in methods and the objective of this research synthesis. This review material includes studies of varying sizes, samples, study design and methods of analysis. A separate appendix (supplementary table 1) with statistical data about the included studies and the instruments used for measuring QoL is available online at http://jech.bmj.com/supplemental.

RESULTS

SOC and QoL

This section describes the findings from the reviewed studies regarding SOC and QoL. Boxes 1 and 2 show the main objectives of the reviewed studies, categorised into quantitative studies (box 1) and qualitative studies (box 2). Furthermore, a distinction between cross-sectional (a) and longitudinal (b) study design is shown.

Instruments used for measuring QoL

In health research in general, and especially in QoL research, there are many instruments that are used to measure physical impairment, disability or handicap—for example, the Sickness Impact Profile and Nottingham Health Profile. Although commonly described as QoL scales, these instruments are better called measures of health status because they focus on physical symptoms. They emphasise the measurement of general health, and make the implicit assumption that poorer health indicates poorer QoL. Few of the early instruments, such as the Medical Outcomes Study 36-Item Short Form, examine the subjective non-physical aspects of QoL, such as emotional, social and existential issues. The emphasis on these aspects is generally weak (Fayers and Machin, [15] p 17).[16]

The specific instruments for measuring QoL were measured by using Czapinski's QoL Questionnaire,[30] The EORTC QoL Questionnaire-C30,[39 58 61 62] The Family QoL Scale—Parent Form,[31] The Ferrans' and Powers' QoL Index,[35 50] The Flanagan QoL Scale,[40 42] Kajandi's QoL Scale,[49] The Lancashire QoL Profile,[57] The Pediatric Asthma QoL Questionnaire,[44] The Comprehensive QoL Scale[45] and The World Health Organization QoL Scale.[55 41]

The following generic instruments for measuring general health were also interpreted as valid and reliable for measuring QoL in the reviewed studies: the Short Form of Health-related QoL 36-Item Short Form,[46] the SF-12,[33] and The Nottingham Health Profile. The Nottingham Health Profile was not initially developed for this purpose.[38 53 54] The Health Index, an instrument measuring general health, was used in studies on patients with uraemia [47] and on patients with HIV infection for measuring health-related QoL.[48]

An overall impression of the review is that there is an array of different instruments used for the measurement of QoL. A definite pattern seems to emerge. Some studies used specific instruments for measuring QoL, others have used generic instruments for measuring health, while still others have used a battery of varying instruments measuring symptoms of diseases,[51 52 63 64] emotional state,[51] self-esteem, family functioning, perceptions of competencies and behaviours.[64] Many of them measure limitations in functioning, disability and symptoms of diseases (see supplementary appendix table 2 available online at http://jech.bmj.com/supplemental).

Impact of SOC on QoL

Findings from cross-sectional studies on various samples such as patients with heart diseases,[38 42 46] HIV infection,[48] cancer,[39] injured patients,[41] patients with Ménière's disease[32 33] and patients receiving home mechanical ventilation[36] support an influence of the SOC on the QoL. Independent of the used measure, the findings showed that the stronger the SOC, the better the perceived QoL in general. Furthermore, the findings confirm the results on children,[44] older adults[35] and in families.[31] The association between SOC and QoL range from 0.17 among patients with angina pectoris[46] to 0.77 among middle-aged patients with high-risk psychiatric problems.[49] The salutogenic model of QoL was applied in two studies among 15 000 children in the Nordic countries.[20 43] The results showed that children had a reasonable QoL with small differences between the countries. The magnitude of the correlation between QoL and SOC was large ($r \geqslant 0.50$) in all the studies with specific instruments for measuring QoL, and somewhat weaker in studies using generic instruments for measuring QoL, with one exception. No significance was reached between the SOC and the QoL among patients with cancer—probably because of the small sample size.[61]

Does SOC predict good QoL?

The capacity of the SOC scale to predict a future outcome—the QoL—is expressed by the predictive validity.[65] The results from longitudinal studies were in the same direction, and confirmed the findings from the cross-sectional ones. Results supporting the salutogenic theory as a factor promoting QoL were reported in patients with schizophrenia,[57] patients with coronary heart disease,[42] Japanese civil servants,[55] patients with ischaemia,[53 54] elderly patients with hip fracture[50] and among middle-aged subjects at high risk of psychiatric disturbances.[49] The findings are consistent, the stronger the SOC, the better the QoL. Family SOC was strongly and positively related to QoL, in families with at least one member having a serious illness.[31] Furthermore, the family SOC was the largest predictor of family QOL.

Structural equation modelling has been considered useful in estimating causality.[28] Findings from a study among young children with asthma and their parents showed that the higher the child's SOC and self-esteem, the higher the scores found, with positive coping patterns.[44] However, differing results were reported. In a study among patients with arthritis, the results failed to support Antonovsky's suggestion that SOC can have positive consequences for the subjective QoL.[45]

Most of the reviewed studies have applied either a cross-sectional or a longitudinal study design. Some studies have applied a qualitative study design. The method used here was a hermeneutic phenomenological approach interpreted within the concept of transition.[58] The findings showed that the SOC

Box 1: Aims of the reviewed studies on the relationship between SOC and QoL: quantitative studies

Studies with a cross-sectional study design

- Describe how a quality of life (QoL) instrument developed especially for children can be applied in a comparative study of children's QoL in the five Nordic countries.[29]
- Examine whether there exist relationships between the level of socioeconomic context, sense of coherence (SOC), health and the QoL.[30]
- Examine the relationship between the collective family SOC and family QoL during the postdiagnosis time of a serious illness.[31]
- Evaluate the self-rated quality of life associated with vertigo, hearing loss and tinnitus in patients with Ménière's disease and identify the potential relationships between these findings, treatment regimens and SOC.[32]
- Evaluate self-reported QoL in patients with Ménière's disease and identify predictors of the results.[33]
- Describe health-related QoL in adolescents and young adults with uncomplicated epilepsy, and compare it with a random sample of the general population.[34]
- Test a conceptual model of proposed relationships between physical health limitations, SOC, illness appraisal and QoL.[35]
- Assess the QoL of patients with neuromuscular disorders and skeletal deformities receiving home mechanical ventilation.[36]
- Evaluate the health-related QoL and SOC in adult survivors of allogeneic, haematopoietic stem cell transplantation.[37]
- Assess QoL in patients with varying degrees of ischaemia in comparison with controls, and to determine whether the degree of lower limb ischaemia and SOC were associated with QoL.[38]
- Investigate experiences of having an indwelling urinary catheter and investigate the association between health-related QoL and SOC.[39]
- Describe and compare SOC and holistic QoL and examine the relationships among SOC, holistic QoL, and gastrointestinal and psychological distress symptoms.[40]
- Investigate whether tetraplegia would affect the ability to experience and identify emotions and whether SOC contributes to self-rated QoL.[41]
- Test whether Antonovsky's SOC construct can explain additional variance in QoL.[42]
- Investigate determinants of psychosomatic complaints in children in the Nordic countries.[43]
- Describe the development and initial resting of the inner core of a conceptual model of resilience in children managing a health condition.[44]
- Investigate the physical and psychological impacts of arthritis on people's QoL.[45]
- Identify and explore the components of patient satisfaction that have the strongest association with health-related QoL among patients with angina.[46]
- Describe and analyse a group of predialytic patients' with uraemia emotional and functional status, sense of coherence and well-being (QoL).[47]
- Explore how a group of HIV-infected patients perceived their health-related QoL in relation to their coping capacity expressed as sense of coherence.[48]

Studies with a longitudinal study design

- Explore the predictive value of individual dispositions hypothesised to be related to coping with stress and to health (The Lundby study, started in 1947).[49]
- Study whether SOC had any predictive power in patients with hip fractures regarding length of stay in hospital, state of confusion and health, functional ability, QoL and municipal home-help service (4-month follow-up).[50]
- Study SOC and emotional state as indirect measures of QoL in relation to coronary artery bypass grafting surgery (1-year follow-up).[51]
- Investigate the relationship between chest pain after coronary artery bypass grafting, QoL and coping capacity (1- and 3-year follow-up).[52]
- Assess the QoL after successful intervention among patients with varying degrees of lower limb ischaemia in comparison with healthy controls and the respondents' degree of SOC (6-month follow-up).[53]
- Assess the impact of haemodynamically successful or unsuccessful bypass grafting or angioplasty on patients' QoL throughout the first year after surgery (1-year follow-up).[54]
- Evaluate the lasting effect of psychosocial characteristics on QoL (1-year follow-up).[55]
- Evaluate the presence of post-traumatic stress symptoms and to identify potential relationships between these findings and SOC and QoL aspects (2–6-month follow-up).[56]
- Examine the construct and predictive validity of the SOC concept in a sample of persons with schizophrenia living in the community (18-month follow-up).[57]

Box 2: Aim of the reviewed studies on the relationship between SOC and QoL: qualitative studies

Studies with a cross-sectional study design

- Investigate the experiences of daily life and life quality (phenomenological-hermeneutic).[58]
- Investigate the structure of the life purpose (QoL) and the ego (method not mentioned).[59]

Studies with a longitudinal study design

- Investigate the QoL and SOC for patients with acute leukaemia and malignant lymphoma (2-year follow-up interviews, content analysis).[60]

played an important role as an internal resource for controlling the life.

Interpretations and conclusions

This review showed that the studies were mainly carried out on various disease-specific groups of patients instead of on the general population. Furthermore, the array of questionnaires used for measuring QoL is striking.

Most of the studies included reported a correlation coefficient that could be of large magnitude ($r \geq 0.50$). The results from the large body of quantitative studies were supported by a study using a qualitative approach for the analysis. Further, the findings from cross-sectional studies were supported by the results from longitudinal ones. The SOC seems to be a resource that enhances the QoL directly, or mediated by a good perceived health. This could be the logical conclusion of the relationship between SOC and QoL.

Implementation of the findings in practice

As a sociologist, Antonovsky knew very well about the impact of social conditions on peoples' health in a society. Antonovsky explicitly pointed out the responsibility of the society to create conditions that induce the strengths of coping—that is, SOC. Eventually, it is not a question about the free choice of the person to cope well, but the key is embedded in society and in people who care about each other.[66] The authors consider the SOC to be a way to promote equity.

A potential of the salutogenic concept is the possibility of applying this framework in the construction of Healthy Public Policies and Health in All Policies.[13 67] This means that it is possible to use it to construct the coherence needed to create a health-promoting society. Such a society becomes salutogenic not only in its health services but also in its general functions and services. Here, it is important to strengthen existing GRRs, create new ones and make them available for the citizens to be aware of, identify and benefit from them.

The salutogenic approach could be applied in practice in different ways. First, it can be used to implement the principles in all policies/healthy public policy (society) to measure and monitor health promotion processes.[13 68] Second, it can be used to explore the potential of the SOC in process-oriented health indicator systems (society).[69 70] This is a new research area; the salutogenic research has not entered yet.

Third, the salutogenic research and the SOC instrument help in interventions and treatment (of groups and individuals).[71 72] An example of how the salutogenic construct could be used in practice is the salutogenic dialogue described by Malterud and Hollnagel.[73 74] The salutogenic concept is suggested to be a valuable base for health-promoting family therapy.[72] A salutogenic model of family therapy has been applied at a university clinic in Lund, Sweden. In addition, the salutogenesis could be seen as a theoretical foundation for health promotion research in general, implemented as a systematic orientation and perspective in the daily activities and actions of the professionals.

Fourth, the SOC is applicable in learning processes and evaluation of education. There has been much focus on health promotion in schools—for example, the WHO framework of Health Promoting Schools. There has previously been a thorough analysis of the similarities between the learning process and the salutogenic model as exemplified in the Swedish national curriculum.[75] The learning process is facilitated when the information is structured and comprehensible and thus becomes meaningful. The salutogenic framework facilitates the learning process and simultaneously promotes health. Applying the salutogenesis in a learning context becomes especially useful for children with special needs.[76] The salutogenic model here becomes a tool for the enhancement of QoL. Further, integrating the salutogenic perspective in all activities and programmes in school also means that health promotion becomes integrated with school development.[77] Further, a model based on the salutogenic perspective has been developed, with the special aim of evaluating education on different levels in the European Union.[78]

DISCUSSION

The main intentions of this review were (1) to synthesise the evidence base of the relationship between SOC and QoL and (2) to relate the findings to the core values of the Ottawa Charter. A further piece is added here to the salutogenic puzzle creating a coherent understanding of the SOC concept.[7 9 10] The first aim is fulfilled—that is, the potential of the salutogenic concept for public health and health promotion. The second aim lies in its applicability at different levels—that is, at individual, group (family) or societal level. It is applicable to healthy people as well as to people afflicted with serious illnesses and disabilities. This is an advantage of the salutogenic model.

Somewhat surprisingly, we found that none of the reviewed studies has explicitly explained the choice of the instrument for measuring QoL. Furthermore, only few studies have discussed what they mean by QoL. The lack of a definition of what the authors conceptualise as QoL and the reasons for choice of measures could be seen as limitations. This seems, however, to be a rather general scientific problem than afflicted to the salutogenic theory.

FURTHER RESEARCH

The further the analysis proceeds, the more evident the hidden potential of the SOC concept becomes. The strength of the salutogenic concept lies in its potential to contribute to societies' ability to adopt a healthy public policy, where the content and the structure of the society and the services are made salutogenic, not only a health policy for the health services. Therefore, it is vital to strengthen the available GRRs,

What this paper adds

- New and coherent knowledge about the relationships between sense of coherence (SOC) and quality of life (QoL)—that is, SOC is a significant predictor of QoL; a strong SOC is strongly related to good QoL; the stronger the SOC, the better the QoL.
- Gives examples of possible applications in public health and health promotion practice.

Policy implications

The sense of coherence (SOC) construct is applicable in healthy public policies in different ways:

- Implementing the principles in all policies/healthy public policy (society);
- Exploring the potential in process health indicator systems (society);
- Interventions and treatment (of groups and individuals);
- Applicable in learning processes and evaluation of education.

to create new GRRs and to enable the citizens to identify and benefit from these. Further, most of the studies were applied on different patient groups. It would be important to apply similar studies in general populations.

Based on the findings from this review on salutogenesis, a certain possibility—of modifying and extending the health construct—is becoming discernible, implicating a health construct including salutogenesis and QoL. The idea is to improve the existing definition of health by integrating the principles of Health Promotion (the Ottawa Charter) and the convention on Human Rights with Antonovsky's salutogenic concept.

> Health promotion is the process of enabling individuals, groups or societies to increase control over, and to improve their physical, mental, social and spiritual health. This could be reached by creating environments and societies characterised of clear structures and empowering environments where people are able to identify their internal and external resources, use and reuse them to realize aspirations, to satisfy needs, to perceive meaningfulness and to change or cope with the environment in a health promoting manner.

The ongoing discussion regarding indicators of health in societies is interesting and highly important.[69] Perhaps the measurement of the SOC in general populations could function as an indicator of the health status of the society. This is a task for further innovations.The most important challenge now is to implement the salutogenic approach on all societal levels in all policies—that is, building healthy public policy in the salutogenic way. Here, coherence is the key word combining our present knowledge of salutogenesis with the main message from health promotion research (after the 2004 Bangkok Charter). Both emphasise the need for synergy in and between action arenas as the way to increase the overall effectiveness.

Supplementary appendix tables are available at http://jech.bmj.com/supplemental

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