

# Effectiveness of Interventions to Enhance the Sense of Coherence in the Life Course

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## Introduction

There is an extensive amount of publications about the Sense of Coherence (SOC), the main concept in salutogenesis (Eriksson and Lindström, 2005, 2006, 2007; Eriksson and Mittelmark, 2017). However, there is a lack of knowledge about studies investigating the effects of interventions, based on salutogenesis during the life course, on SOC (Bauer et al., 2019; Hochwälder, 2019). Besides, there is a call for reaching a consensus that defines what characterizes a salutogenic intervention and the minimal characteristics that a salutogenic intervention should follow (Álvarez et al., 2020).

Antonovsky (1979, 1987, 1992, 1996a) claimed that the Sense of Coherence is an internal experience that gradually develops during youth to a rather lasting and stable quality of an individual after 30 years of age. He emphasized that this is a hypothesis based on theoretical considerations and is not based on empirical evidence (Antonovsky, 1996a). However, Antonovsky made this tentative hypothesis in 1987, over 30 years ago. The world and societies have developed and changed since then. People live longer in general and experience major life changes after 30 years of age. They participate in different kinds of therapies or

coaching, start a new partnership, parenthood, education, different kind of courses, and new jobs. In general, knowledge is much more available. Accordingly, the view that the SOC is stable after 30 years of age might be modified (Suominen, 1993). Research also indicates that the SOC may become stronger due to major life events such as childbirth (Lindström et al., 2017) or experiences in everyday life (Maass et al., 2017).

In the last two decades, there was an increasing research interest in the ability of tailored interventions to modify and strengthen the SOC of various target groups. Research emerged on therapies, training, or interventions aiming to strengthen the SOC (Langeland et al., 2006). However, an overview of empirical evidence on the SOC's changeability by health-promoting interventions is lacking. The main purpose of this chapter is to provide a synopsis of interventions over the life course and their effectiveness on the SOC. Besides, we aim to assess to what degree the content and methods of each intervention are salutogenic.

## The Theory of Salutogenesis and Interventions

According to Antonovsky (1987), the salutogenic orientation does not view health as a dichotomous variable, but instead as an active process along a continuum. It focuses on the story of the whole person and life situation rather than on specific problems and diagnoses. It sees people as biological, psychological, social, and spiritual beings who are both proactive and reactive, and who make choices. Persons are perceived as actively involved in health-seeking and self-actualization. Further, salutogenesis understands tension and strain as potentially health-promoting, rather than as inevitably health-damaging. The use of potential and/or existing general and specific resistance resources (GRRs and SRRs) enhances the SOC, and the individual's active adaptation is emphasized as the ideal in treatment. This illustrates that the

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theory of salutogenesis is a broad and comprehensive theory, and it provides a general understanding of how the SOC and well-being are created. Research shows that a strong SOC will also improve especially mental health (Eriksson and Lindström, 2006). The theory has been applied in several fields, such as nursing (Sullivan, 1989) and mental health care (Eriksson and Lindström, 2006; Griffiths, 2009; Langeland, 2007; Langeland et al., 2006; Langeland and Vinje, 2017). Salutogenesis has also been suggested as a suitable framework for public health development (Eriksson and Lindström, 2006; Super et al., 2016), health promotion (Antonovsky, 1996b; Garcia-Moya and Morgan, 2017), healthy aging (Lezwijn et al., 2011), workplace health promotion (Vaandrager and Koelen, 2013), mental health rehabilitation (Griffiths, 2009; Pijpker et al., 2019), mental health promotion (Langeland and Vinje, 2013), and maternity care (Downe, 2010; Meier Magistretti et al., 2016).

The main aim of salutogenic interventions is to create an environment with meaningful and attainable resources and thus arrange for that individuals and groups might come into a positive interplay between the use of internal and/or external resistance resources and the SOC. This means that there are many ways to possibly promote the SOC dependent on a person's or a group's needs and available resources. Yamazaki et al. (2011) have concluded that the first intervention program based on the salutogenic model of health (salutogenic orientation and main concepts) and aimed to strengthen Sense of Coherence as one main outcome was developed by Langeland et al. (2007), and this intervention program has been further developed in Langeland and Vinje (2013).

Up to present, we lack an overview of how much interventions based on salutogenic theory are effective to positively change the SOC.

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## Methods

This is a scoping review (Grant and Booth, 2009), including quantitative intervention studies with SOC as an outcome. We have systematically searched for, appraised, and summarized the existing research evidence on intervention studies with the SOC as a primary or secondary outcome.

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## Data Searches

We have carried out searches in the databases PubMed, PsycINFO, Ovid, ERIC, Embase, SocINDEX, Cochrane, Cochrane trials, Cochrane review, and Google Scholar. The inclusion criteria were English literature from 2005 to 2019, focusing specifically on intervention studies with the SOC as an outcome. We included RCTs, controlled clinical trials, and follow-up studies.

The data searches have been performed twice, where we included new search terms in the second search. The first search has been performed by an especially trained librarian and the fourth and the last author. The fourth author and last author also provided a first summary of all the retrieved articles to facilitate selection and further additions by the last author. Another librarian, trained specially in health disciplines, and the first author, have performed the second searches. The reference lists of all the papers retrieved have been examined for any paper missed with the other searches.

In the first searches, we identified 31 included articles. In the second search, we included an additional ten articles. Two articles were excluded because of insufficient reporting of the SOC scores. Thus, we finally considered 41 included articles (see Table 20.1 for an overview of the search process). Table 20.2 (Cf. The electronic supplementary file) shows a summary of the 41 articles, including authors, year of publication, country, title, method, sample, salutogenic intervention content, assessment points, and effect on the SOC.

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## Definition of the Criteria for Salutogenic Interventions

We developed five criteria based on salutogenic theory as well as on the work of Langeland et al. (2007), Langeland and Vinje (2013), and Polhuis et al. (2020). The criteria that designate an intervention salutogenic are defined as follows:

1. A focus on health-promoting factors: general resistance resources (GRRs) and/or specific resistance resources (SRRs).

Explanation: To promote health from a salutogenic perspective, the primary focus of the intervention must be on the dynamic interaction between GRRs, SRRs, and stressors in human life, thus facilitating the use of resistance resources and support the participants to move toward the healthy end of the health continuum.

Background: According to the theory of salutogenesis (Antonovsky, 1987), to increase awareness of internal and external resources and increase the ability to use them promotes the transformation of tension and stress into coping (Langeland et al., 2016; Langeland et al., 2007).

2. A whole-person approach (WPA).

Explanation: This perceives the participant as a whole person and includes the life course within the life circumstances of the participant. Understanding the unique life story and current life situation of people is important for providing meaningful interventions.

Background: In a salutogenic approach, the focus is on the history and experiences of human beings rather than

**Table 20.1** Overview data searches

Database	Keywords	Number of hits	Inclusion criteria	Exclusions (title)	Exclusions (abstract) incl. duplicates	Number of suitable hits	Excluded (duplicates, theoretical, not intervention not relevant)	Included
PsycInfo Psyndex plus; ERIC	“Sense of coherence” AND intervention OR training AND increase OR strength* OR enhance*	298	English literature; from 2005 to 2019 /focuses specifically on interventions that should bring about a change in the SOC	189	68	41	Totally 79	<b>Totally 31</b>
Google Scholar	Sense of coherence; intervention; increase; strengthening; enhance	980	English literature; from 2005 to 2019 /focuses specifically on interventions that should bring about a change in the SOC	876	79	25		
PubMed	Sense of coherence; intervention; enhance	136	English literature; from 2005 to 2019 /focuses specifically on interventions that should bring about a change in the SOC	76	26	34		
Cochrane	“sense of coherence” AND intervention OR training AND increase OR strength* OR enhance*	73	English literature; from 2005 to 2019 /focuses specifically on interventions that should bring about a change in the SOC	31	32	10		
<b>New search: December 4, 2019</b>								
Oria	Salutogen*OR “Sense of coherence” AND intervention* AND effect*	102	English literature; from 2005 to 2019 /focuses specifically on interventions that should bring about a change in the SOC.	89	13	–	–	–
PubMed	“Sense of coherence” AND salutogen* AND intervention* AND effect*	8	English literature; from 2005 to 2019 /focuses specifically on interventions that should bring about a change in the SOC.		6	2		2
Embase	“Sense of coherence” AND intervention* AND effect*	118	English literature; from 2005 to 2019 /focuses specifically on interventions that should bring about a change in the SOC		111	7		7
Cochrane	Reviews “Sense of coherence”	28	2005–2019	13	14	1		1
								<b>A total of 41 included articles</b>

focusing solely on disease and physical health (Antonovsky, 1987). Health incorporates multiple aspects of well-being (Antonovsky, 1996b). Therefore, salutogenic interventions must take into account multiple aspects of health and well-being, including the physical, mental, social, and spiritual dimensions of participants.

### 3. Active adaptation (A).

Explanation: The focus is on the participant’s ability to actively adopt or become actively involved in the interplay between the person or group and the internal and external environment. Adjusting intervention strategies to the

individual's priorities, motivations, and capabilities increases the chance of accomplishing meaningful and active participation in the interventions. Active participation facilitates the successful change in comprehensibility, manageability, and meaning, as well as the implementation of newly adopted attitudes and behaviors in everyday life.

Background: Active adaptation is ideal in treatment (Antonovsky, 1987). This orientation leads us to the overall problem of active adaptation to an inevitably stressor-rich environment (Antonovsky, 1987). It is crucial that the participants experience appropriate challenges and thus develop the ability to use the resources (Langeland and Vinje, 2013; Langeland et al., 2007).

#### 4. Stressors and Tension as potentially health-promoting (ST).

Explanation: This point is based on the understanding that stressors and tension are normal to experience. When demands or expectations are perceived as appropriate and challenging, the tension will be transformed into coping experiences (Antonovsky, 1987; Langeland and Vinje, 2013; Langeland et al., 2007). Magrin et al. (2006) define tension as "the salt of life."

Background: In the salutogenic model, stressors, tension, and strain are potentially health-promoting. Antonovsky (1987) distinguishes between tension and stress. When demands exceed a person's resources or a person's ability to use resources, then the tension created by the stressor leads to stress and the person moves toward the dis-ease end of the continuum.

#### 5. A focus on the SOC as a learning process (L).

Explanation: To learn is to discover and use GRRs and SRRs, thus promoting a constructive self-identity, SOC, and health. A learning process focused on self-identity and social support may lead to the discovery of individual internal and external resources that can be used to facilitate coping with life challenges.

Background: In a salutogenic approach, health is understood as a lifelong process in which people learn to identify resources and to use them (Lindström and Eriksson, 2010). The process consists of: (a) experience life as being consistent, (b) to find an appropriate overload/underload balance, and (c) to participate in making decisions that are relevant to one's own life thus strengthening identity and other important resources (Antonovsky, 1987).

We rated the interventions according to the degree they fulfill the criteria for a salutogenic intervention. For each intervention, we assessed and determined the extent they matched the criteria. All authors did that individually by labeling each

intervention as follows: specific resistance resources (SRRs) and/or general resistance resources (GRRs), whole person approach (WPA), active adaptation (A), stressors and tension as potentially health-promoting (ST), and learning (L). The labeling was then compared. Interventions that were assessed differently were studied again by the first, second, and last author individually and then discussed up to a consent agreement.

Some interventions combined salutogenic and pathogenic elements. Although the pathogenic elements might be in the description of the aim of the intervention such as prevent illnesses or stress and reduce burnout instead of describing what to promote such as promote coping and well-being, they have been defined as salutogenic if the content of the intervention fulfilled the criteria.

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## Findings

### Search Outcomes

The search identified 41 articles that fulfilled the inclusion criteria. This includes 22 RCT studies, 11 follow-up studies with a control group, and 8 follow-up studies without a control group. Many of the included studies did not explicitly define whether the SOC was a primary or secondary outcome. In studies that have included several outcomes and that did not define primary and secondary outcomes, we defined the SOC as a primary outcome when it has been included in the title and/or mentioned first in the measure section of the article.

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### The SOC as the Outcome of the Studies: The Extent of Salutogenic Content in the Intervention and the Development of the SOC

Table 20.2 (Cf. The electronic supplementary file) contains an overview of all included studies and the coded interventions as specific resistance resources (SRRs) and/or general resistance resources (GRRs), whole person approach (WPA), active adaptation (A), stressors and tension as potentially health-promoting (ST), and the SOC as a learning process (L)

The 41 articles have been classified according to their main target groups and are presented in the following paragraphs. The description of each study follows the structure: Specific target group, setting, content, length, frequency, the level of salutogenic content assessment, and the development of the SOC. The studies are described and discussed in the following paragraphs structured by the target groups of the interventions.

## Young People

Nammontri et al. (2013) have performed a cluster RCT study, including a salutogenic intervention for enhancing oral health with the SOC as the primary outcome.

Students ages 10–12 years old participated in seven 40- to 60-minute sessions delivered by teachers over two months, focused on child participation and empowerment. The first four sessions were classroom activities involving didactic teaching, discussion, activities, and games. The last three sessions involved working on healthy school projects: brainstorming, planning, implementation, and evaluation. This intervention fulfilled four of the salutogenic intervention criteria: it addressed the participants with a whole-person approach (WPA), active adaptation (A), and enhanced an active learning process (L). They also received access to GRRs such as activities, games, and most likely social support. The SOC improved significantly in the experiment group ( $n = 133$ ) compared to the control group ( $n = 128$ ) both two weeks and three months after the intervention.

Another RCT study (Recabarren et al., 2019) included an intervention about stress prevention, quality of life, well-being, and psychological resources among university students with the SOC as a secondary outcome. The program included eight 2-hour weekly sessions with a salutogenic multidimensional stress prevention program, integrating mindfulness-based activities, cognitive and behavioral strategies, social skills exercises, and emotional regulation (A, GRRs, and L). Homework between sessions was also proposed (L). Participants performed written exercises, discussions, and role-playing in personal or fictive situations based on different types of material and triggers such as videos, audio, and visual supports (WPA). The program did fulfill four of the five criteria. The SOC improved significantly in the intervention ( $n = 32$ ) after eight weeks (from before to after intervention) compared to the control group ( $n = 32$ ).

Bronikowski and Bronikowska (2009) is a controlled clinical trial among adolescent boys aiming at improving the health resources of adolescent boys with the SOC as a secondary outcome. The program, which lasted 15 months, included regular moderate to vigorous physical activity (MVPA). During four lessons of physical education per week, the teacher used at least one activity per lesson including the following teaching strategies: teacher talk, modeling (being), reinforcement, reflection time, and student sharing to improve the levels of self-control, involvement, self-responsibility, and caring-responsibility of pupils. Additionally, a specially self-designed, personalized form “Planning of Leisure-time Physical Activity” was used. The program provided access to GRRs, active adaptation (A), and learning (L) related to physical training together with others. It did not fulfill the other criteria WPA and ST and was therefore considered to be a moderate salutogenic inter-

vention. The pre- and post-intervention showed a significant difference between the groups on the SOC after a 15 months salutogenic program. However, the significant differences between the groups were due to decreased SOC in the control group ( $n = 115$ ), and there was just a slightly SOC improvement in the experiment group ( $n = 84$ ).

Davidson et al. (2012) have done an intervention study among first-year college students with the SOC as a secondary outcome. The participants were distributed in three groups ( $n = 14, 15, 14$ , respectively), all included salutogenic elements (promotion of hope, sense of coherence, and self-efficacy for enhancing students’ academic adjustment), but one of these groups had an explicit focus on salutogenesis. The version of this workshop delivered to this group included a short lecture on the salutogenesis paradigm, including the SOC construct in addition to the short lecture on hope theory that the other groups received. In addition, they filled out a cognitive-mapping worksheet that was in line with the salutogenesis model and focused their attention on lessons they learned in the past and their future expectations. This intervention satisfies three of the five salutogenic criteria. The programs provided access to GRRs and their participation in workshops promoted their active adaptation (A) and learning process (L). At the times of measurement, just after the intervention one month after the conclusion of the program, there was a significant improvement in the SOC across the groups. However, there were no significant differences between the groups on the SOC.

A total of three of the four studies that have been performed among younger people showed a significant difference in the SOC in favor of the salutogenic intervention group. It includes two RCTs and two follow-ups with the control group(s), all with salutogenic elements in the interventions. The strongest salutogenic intervention seems to be Nammontri et al. (2013). It had the SOC as the primary outcome, it had the best design with adequate sample size, and it observed significant effects at two weeks and three months after the intervention. Recabarren et al. (2019) also has a strong design and good salutogenic content, but a much smaller sample and the significant effect are measured just after the intervention. The other two studies (Bronikowski and Bronikowska, 2009; Davidson et al., 2012) have weaker designs, salutogenic content, and effect. All the three latter had the SOC as a secondary outcome.

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## Occupational Health/Unemployed People

An RCT (Valtonen et al., 2015) among 234 occupational healthcare clients with depression with the SOC as a primary outcome consisted of a group intervention ( $n = 134$ ) emphasizing the interaction between body and mind of 6 months and 31 active days. It consisted of four courses, the first two



to understand the depression symptoms, and the third and fourth were focused on rehabilitation. It aimed at increasing the self-knowledge of depressive symptoms (SRRs), teach more effective coping with stressors (A and L), and provide peer and social support (SSRs). Thus it fulfilled three of the five salutogenic criteria. It found a significant improvement of the SOC in both the intervention and control group 6 months and one year after the intervention. However, there was no significant difference in the mean SOC scores between the groups at these follow-ups.

Another RCT (Viding et al., 2015) among 36 women with burnout with the SOC as a secondary outcome consisted of an intervention hosted by four healthcare centers and included a mixture of different cultural activities (a so-called Culture Palette): interactive theater, movie, vocal improvisation and drawing, dance, mindfulness training, and a musical show (GRRs). The intervention was based on the idea that cultural activities can enrich and enhance memory (L), stimulate connections among brain networks, and enable to accelerate learning (A) and differentiate feelings of meaning and context (SRRs and GRRs). It found no significant differences between the intervention and the control group after three and six months.

A controlled clinical trial of Kähönen et al. (2012) among employees suffering from severe burnout symptoms consisted of interventions of 16 separate days, over 9 months, with the SOC as the primary outcome. There were two intervention groups: one “psycho-dramatic” ( $n = 25$ ) and one “action-based” ( $n = 24$ ) and control group ( $n = 28$ ). A common issue in both group methods was to investigate the balance between work, social life (including family life), and personal hobbies (A). Another common issue was to investigate participants’ values, beliefs, attitudes, and patterns of behavior (WPA), especially those exposed to conflicts in their work (L). The “psycho-dramatic” method was based on a free discussion in several steps. In the beginning, group confidence and group cohesion were built up (SRRs). Cards and figures were used to help the group members express their feelings and ideas (GRRs). Drawing, music, and writing (GRRs) were used to investigate and express the group members’ inner worlds. Muscle relaxation and exercises using the imagination (GRRs) were used in the last session of the day. During the intervention, every participant could be the protagonist of the day, that is, to use the whole group and coordinators to investigate through psychodrama something of crucial importance to him-/herself (A). Thus, it fulfilled four of the five salutogenic criteria. It found a significant increase in the SOC in favor of the intervention groups nine months after the intervention.

Another controlled clinical trial of Merakou et al. (2019), with the SOC as the primary outcome, among unemployed individuals with anxiety disorders, consisted of an intervention of a Progressive Muscle Relaxation (PMR) program

(GRRs) and counseling services (SRRs). The participants were divided into four subgroups of six to eight people attending a two-month training course. The training (L) included four weekly sessions (45 min) facilitated by a professional PMR trainer. Participants were asked to practice at home (A). Thus it fulfilled three of the five criteria. Both groups received counseling services once a week during the entire period. It found a significant increase in the SOC after eight weeks in the intervention group ( $n = 30$ ) and no significant changes in the control group ( $n = 20$ ).

A follow-up study of Vastamäki et al. (2009) among 74 unemployed individuals, with the SOC as the primary outcome, consisted of a 6-month intervention program that provided support in the job-search process and personal life situations. The program combined three kinds of activities: labor market activities (i.e., vocational training and subsidized employment), personal guidance, and networking (SSRs) with other organizations providing support for the unemployed. After the start-up period, individual needs were assessed as a basis for further guidance processes, and different services were provided according to diverse needs (WPA). Through networking, healthcare services and financial support could also be provided (SSRs). At the beginning of the intervention, all participants took part in group counseling (L), which lasted two months. Participants’ job-searching skills and activity (A) were improved, and their coping skills were strengthened to boost the job-search process and to make the process less stressful. It fulfilled four of the five criteria. It found a significant increase in the SOC over a 6-month period.

Another follow-up study (Gunnarsson and Bjorklund, 2013), with the SOC as a secondary outcome, among 35 persons with different mental health challenges consisted of an intervention of 5 sessions that included creative activities and occupational storytelling and was called “The Three Team Method” (TTM). The TTM implied that the clients draw and paint trees symbolizing various periods in their life (A). The pictures were then used as a starting point to tell their life story (L and WPA) to enhance their well-being and management of their everyday life (GRRs/SRRs). It showed a significant change in the SOC at three years’ follow-up.

There are a total of six studies under this section of which all (Gunnarsson and Bjorklund, 2013; Kähönen et al., 2012; Merakou et al., 2019; Valtonen et al., 2015; Vastamäki et al., 2009; Viding et al., 2015) have SOC as a primary outcome except Gunnarsson and Bjorklund (2013) and Viding et al. (2015) that had the SOC as a secondary outcome. The strongest salutogenic interventions seem to be the controlled clinical trial of Kähönen et al. (2012) and the follow-up of Vastamäki et al. (2009) that also affected follow-up at nine months and six months, respectively. However, they included small sample sizes and had rather weaker designs. The follow-up study of Gunnarsson and Bjorklund

(2013) included a rather strong salutogenic intervention and revealed significant change in SOC at three years' follow-up. However, this study applied a weak design and had a rather small sample size.

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## Health Professionals

An RCT consisted of medical personnel with burnout (Brooks et al., 2010) with the SOC as a secondary outcome. The intervention consisted of music and imagery experiences, 60–75 minutes a session per week, where the participants were guided through body relaxation and directed imagery experiences while listening to music (SRRs). Based on the needs of the participants, the research assistants selected pre-scripted directed imagery experiences. These directed music-guided imagery experiences typically included the participant interacting or relaxing in a nature scene (A and L). The intervention fulfilled three of the five criteria. The study showed that the experiment group ( $n = 24$ ) and control group ( $n = 23$ ) had no significant differences in the SOC after six weeks (before to after intervention).

A small clinical controlled trial of Sarid, Berger, Eckshtein, and Segal-Engelchin (2012) had the SOC as a primary outcome. The participants were nurses with occupational stress. The cognitive-behavioral intervention that was used in this study was based on a variety of cognitive-behavioral principles and techniques and not on a particular theory, thereby allowing them to choose the strategies that were most effective for them (A). Four-hour meetings took place once a week for 16 weeks. Behavioral interventions included teaching and practicing breathing techniques and progressive muscle training. Participants were taught to question their self-defeating thoughts by examining evidence, practicing the strategies to reduce psychophysiological aspects of stress, and rehearsing skills they acquired (L). Each meeting started with a theoretical presentation followed by the practice of and reflections on the relevant skills (GRRs). The intervention fulfilled three of the five criteria. There was a significant difference between intervention ( $n = 20$ ) and control group ( $n = 16$ ) in the SOC after four months (before to after intervention) in favor of the intervention group.

A pilot follow-up study among 38 nurses and midwives (Foureur et al., 2013) with the SOC as a secondary outcome, including a mindfulness-based program (GRRs) over eight-week daily practice (A and L) included knowledge of stress on the body, mind, emotion, and behavior (GRRs). Further, the content was daily meditation practice for 20 minutes, a repertoire of strategies for mindfulness on a day-to-day basis, and forming habits of daily mindfulness practice (L). The intervention fulfills three of the five salutogenic criteria. The study reveals significant positive strengthening of the SOC after eight weeks (before to after intervention).

This section consists of one RCT, one controlled clinical trial, and one follow-up. All the studies included relatively small samples and moderate salutogenic content (fulfilled three salutogenic criteria). Two of the studies (Foureur et al., 2013; Sarid et al., 2012) had positive development of the SOC before to after intervention. The study of Sarid et al. (2012) was the only one with the SOC as the primary outcome.

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## People with Disabilities, Psychosomatic, and Mental Health Problems

A three-armed RCT study among adults suffering from psychological stress (Arvidsdotter et al., 2015) with the SOC as secondary outcome consisted of two intervention groups: therapeutic acupuncture (TA) and integrative treatment (IT) ( $n = 40$ ) and conventional treatment (CT). IT was a combination of a person-centered approach in a salutogenic dialogue and TA. The dialogue focused on the patients' understanding of meaning and resources to help them become aware of and mobilize their strengths and potential for managing their conditions (A, L, and WPA). The dialogue was exploratory and reflected on inner feelings, personal relationships, everyday activities (diet, exercise, relaxation, sleep habits) (L), and existential issues in an atmosphere that aimed to strengthen the therapeutic alliance (SRRs). It was performed once a week, 60 minutes per session, for 8 consecutive weeks. It fulfilled four of the five criteria for a salutogenic intervention. The results revealed significant improvements in the SOC in both intervention groups (most in the IT group) after eight weeks (before to after intervention) compared to CT.

An RCT (Forsberg et al., 2010) among persons with psychiatric disabilities with the SOC as a secondary outcome included a program for a healthy living, healthy diet, and physical activity. Each study circle comprised 5–13 participants, including between two to seven residents and three to seven staff members, and all circles had the same leader. They met twice a week for two hours for the duration of 12 months, once a week for diet sessions and once a week for physical activities (SRRs and L). The participants were encouraged to actively participate (A). The intervention fulfilled three of the five salutogenic criteria. The study revealed significant differences between the intervention ( $n = 24$ ) and the control group ( $n = 17$ ) in the SOC after 12 months (before to after intervention) in favor of the intervention group.

Another RCT (Langeland et al., 2006) among adults with mental health challenges with SOC as primary outcome consisted of a salutogenic group intervention program. The group intervention program targets people with various mental health problems who live at home but need support from the health system (see Langeland and Vinje 2013, 2021). The intervention was a talk-therapy group once a week, 16 times, each two hours, based on salutogenesis

(the five basic salutogenic principles and core concepts the SOC and GRRs). The main objective of the group intervention in this study was to increase participants' consciousness of their potential, their internal and external resistance resources (GRRs, SRRs), and their ability to use them (L) in everyday life (Cf. Langeland et al. (2007)). Active adaptation (A) and tailoring and person-centeredness (WPA) was key. The intervention thus fulfilled all five salutogenic criteria. It revealed significant improvement in the intervention ( $n = 56$ ) group compared to the control ( $n = 42$ ) group from before to after intervention. At 12 months' follow-up, there were still differences between the groups in favor of the intervention group. However, the differences were not significant.

Among people with psychosocial disabilities, Sancassiani et al. (2017) have performed an RCT with the SOC as a secondary outcome. The intervention was a psychosocial rehabilitative intervention focused on sailing (SRRs). It was a structured course to learn sailing in a crew lasting (A and L) three months; two lessons a week, each almost four hours. The intervention met three of the five salutogenic criteria. There were no significant differences between the intervention ( $n = 23$ ) and control ( $n = 28$ ) group after three months (before to after intervention).

A pilot RCT (Schrank et al., 2016) among people with psychosis, with the SOC as a secondary outcome, included an intervention that targeted four areas of development: increasing positive experiences, amplifying strengths, fostering positive relationships, and creating a more meaningful self-narrative (A, L, and SRRs). These areas were addressed using ten exercises adapted from standard positive psychotherapy (PPT): positive introductions, savoring, good things, identifying personal strengths, personal strength activity, and strength activity with significant other, forgiveness, gratitude, and positive responding (L). Sessions begin and close with music savoring exercise. In contrast to standard PPT, WELLFOCUS PPT has a reduced focus on literacy and didactics but instead includes more experiential and interactive components. All exercises and homework tasks were tailored to the individual to be specific, attainable, and personally meaningful (WPA). Participants received a phone call between sessions to support them with homework and reflect on what they have learnt. The intervention was assessed to fulfill four of the five salutogenic criteria. The results showed significant development of the SOC in the intervention group ( $n = 47$ ) from before to after intervention compared to the control group ( $n = 47$ ).

A follow-up (Højtdahl et al., 2015) among 534 women in correctional settings with the SOC as primary outcome consisted of an intervention called the "VINN" program. The program has been described in detail elsewhere (Højtdahl et al., 2013; Højtdahl et al., 2014) and is built on the program about salutogenic talk therapy groups (Langeland et al., 2006; Langeland et al., 2007). Briefly, two facilitators

and four to eight women meet for up to 15 three-hour sessions over 6–12 weeks. Combined with homework exercises, relaxation exercises, and group work, the women were encouraged to identify something meaningful that they can engage within their personal lives (A and L). In the groups, each woman's personal motivation for and commitment to change behavior (L and ST) was purposefully stimulated, within an atmosphere of acceptance and compassion (WPA). The intervention fulfilled all the salutogenic criteria. The results revealed significant improvements in the SOC from before to after intervention.

This section included six studies (five RCTs and one follow-up) of which two had strong salutogenic content (Højtdahl et al., 2013, 2015; Langeland et al., 2006, 2007). Both revealed significant effects from before to after intervention on the SOC that was the primary outcome. Langeland's study had the strongest design of these two. The four other studies had the SOC as a secondary outcome. A total of two studies (Arvidsdotter et al., 2015; Schrank et al., 2016) also had a rather strong salutogenic intervention content. Both were RCTs and revealed effects on the SOC from before to after intervention. The RCTs of Forsberg et al. (2010) and Sancassiani et al. (2017) both had moderate salutogenic content in the intervention. While Forsberg et al. (2010) showed a significant effect on the SOC from before to after intervention, the study of Sancassiani et al. (2017) did not affect SOC.

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## People with Physical Problems and Hospital Patients

An RCT (Bringsvor et al., 2018) among persons with chronic obstructive pulmonary disease used the SOC as a secondary outcome. The self-management intervention, "Better living with chronic obstructive pulmonary disease," aimed to increase the participants' consciousness of their potential, their internal and external resources, and their abilities to use them, and thus to improve their self-management capabilities in the context of everyday living. The intervention was ongoing once a week (2 hours) over 11 weeks and treatment as usual along with the new intervention. A salutogenic orientation was incorporated into group conversations. This orientation included a focus on the SOC; understanding, manageability, and meaningfulness (L), and on emphasizing health as a continuum focusing on resources for health (GRRs), the person's history (WPA), the understanding of tension and strain as potentially health-promoting (ST), and active adaption (A), as described by Langeland et al. (2007). Motivational interviewing (MI), congruent with improvement in self-efficacy, enhanced activation for self-management, and a salutogenic approach was used as interaction styles. All salutogenic criteria seem to be fulfilled. The



intervention group ( $n = 92$ ) had no significant changes in the SOC compared to the control group ( $n = 90$ ) after 12 weeks.

Another RCT study (Graziano et al., 2014) among persons with multiple sclerosis, with the SOC as a secondary outcome, included intervention sessions held in a castle surrounded by a park (GRRs). The topics of the four sessions were as follows: identity change and redefinition following the diagnosis of multiple sclerosis (SRRs), life goals that gave people a sense of coherence before the diagnosis and life goals that might give a sense of coherence after the diagnosis (L), the definitions of new, realistic, and personally meaningful goals in life, strategies to reach goals and behavior evaluation (WPA); the promotion of self-efficacy over symptoms, the management of negative emotions related to the illness; positive, negative, and illusory thinking related to the illness; effective communication and the ability to ask for help (A) and also homework. Thus, a total of four of five of the salutogenic criteria seem to be fulfilled. The study found that the SOC increased in the intervention group ( $n = 41$ ) compared with the control ( $n = 41$ ) after six months from before to after intervention, though the differences were not significant.

Nøst, Steinsbekk, Bratas, and Gronning (2018) report on their RCT among adults with chronic pain with the SOC as a secondary outcome. It included an intervention group that was a group-based chronic pain self-management course with 2.5-h weekly sessions for six weeks comprising cognitive and behavioral strategies (SRRs) for pain management, movement exercises, group discussions, and sharing of experiences among participants (L). The course addressed central self-management skills such as goal setting, action planning, and problem-solving and focused on empowering the participants to play an active role in their healthcare (A). The course emphasized group discussions and sharing of experiences among participants. The salutogenic content fulfilled three of the five criteria. The study found no significant differences between the intervention ( $n = 60$ ) and control ( $n = 61$ ) group after 6 weeks (before to after intervention), 6 months, and 12 months.

An RCT (Jensen et al., 2016) among intensive care units survivors with the SOC as a secondary outcome included an intervention that was a nurse-led individualized intensive care units recovery program. The program was based on literature and theoretical approaches toward psychological recovery, including the salutogenic model, illness narratives, person-centered communication, and elements from guided self-determination and trauma-focused cognitive behavioral therapy (SRRs). The recovery program consisted of three consultations conducted by trained study nurses. The first consultation was conducted at the clinic with the patient and close relative at 1–3 months post-intensive care units. The dialogue focused on past and present as the patient was supported in constructing an illness narrative (A and L). A prerequisite for dialogue was the provision of patient photo-

graphs taken by intensive care units nurses during recovery. Second and third consultations at 5 months and 10 months post-intensive care units were conducted by telephone. Patients prepared by completing “Reflection sheets” indicating issues of importance to the individual (L). A total of three of the five were assessed to be fulfilled. The results revealed no significant changes between the intervention ( $n = 136$ ) and control ( $n = 196$ ) group in the SOC after 3 months and 12 months.

A cognitive behavioral therapy (CBT) program was investigated in an RCT (Malm et al., 2018) among atrial fibrillation (AF) patients where the SOC was a secondary outcome. The CBT program consisted of three 2.5-hour group sessions over nine weeks, with four to six AF patients, including spouses. In these sessions, participants were trained to be aware of their breathing, and heart rate variability biofeedback was demonstrated. In brief, patients in the first session tried to identify and stop unpleasant feelings and negative thoughts that led to cognitive distortions. Positive psychology (SRRs) was focused upon in the second session. In the final session, the patients were taught to work smarter rather than harder (L). Each subsequent session included at least a 15–20-minute mindfulness practice (SRRs) that targeted the different foci, for example, heart focus, and heart breathing guided by the therapist. This was followed by an inquiry about the participants’ experiences during practice, as well as encouragement to practice at home daily (A and L). A total of three of the five Salutogenic criteria seems to be fulfilled. The study found that the SOC improved in the CBT group ( $n = 56$ ) after the 12-month follow-up, compared to the TAU group ( $n = 55$ ).

A controlled clinical trial (Dehnavi et al., 2019) among persons with MS and with the SOC as primary outcome included an intervention that was a 12-session unity-focused psychodrama therapy plan for six weeks. It consisted of a description of psychodrama and its techniques, unity-oriented psychology theory, rules, building confidence and training the participants to exercise talking skills, establishing a dialogue and presenting a problem (A), concentration exercises using nonverbal ways to express awareness of emotions, getting familiar with concepts of “unity in diversity” and “diversity in unity,” getting familiar with the language of body and soul and the dialogue of soul and body in the form of psychodrama for unity-oriented connection to the universe (L and WPA), practicing death awareness for understanding the immortality of the soul, and emotional and mental linkage with the source of being (L). The intervention fulfills four of the five salutogenic criteria. The results revealed significant differences between the intervention ( $n = 10$ ) and control ( $n = 10$ ) group on the SOC two months after the completed intervention.

Another follow-up study with a control group (Hirsikangas et al., 2018) with the SOC as a secondary outcome included

frequent attenders (FA) to their general practitioners. They had different physical diseases. The intervention included the following: FAs individualized care plans, assessment of FAs care needs and resources, coordination of multi-professional services, and support of FAs in self-management. The intervention emphasized the continuity of care and building a confidential care relationship (A). It also included a patient-oriented education (L), active self-management support (A), and patient's capabilities (SRRs). FAs had an individual, customer-oriented plan in two years, and FAs visited with their matron concerning all of their health-related issues. A total of three of the five salutogenic criteria seems to be fulfilled. There was no significant differences between the intervention ( $n = 285$ ) and control ( $n = 177$ ) groups and the SOC decreased after two years.

Among persons with type II diabetes mellitus, with the SOC as the primary outcome, Odajima, Kawaharada, and Wada (2017) have performed a follow-up study with a control group. The intervention comprised four 30-minute group sessions and was delivered by experienced nurses. The specific types of support were as follows: The educational goal of the first session included (1) promoting mutual understanding among participants (A), (2) sharing feelings during care (A), and (3) understanding the meaning of enhancing the SOC (L). The educational content of the first session covered: (1) feeling burdened by the disease and treatment, (2) how patients have managed their diabetes to date, (3) what patients learned after diabetes diagnoses (L), and (4) SOC. A total of three of the five salutogenic criteria seems to be fulfilled. The results revealed significant improvement in the SOC in the intervention group ( $n = 21$ ) compared to the control group ( $n = 19$ ) after two weeks.

A prospective intervention study with a control group (Norrbrink Budh, Kowalski, and Lundeberg 2006) among patients with spinal cord injury and neuropathic pain consisted of a pain management program that had the SOC as a secondary outcome. It included 20 sessions over ten weeks and with educational sessions, behavioral therapy, relaxation, stretching, light exercise, and body awareness training (SRRs). The sessions included training in mindfulness, attention-diverting strategies, cognitive reappraisal, social skills training, the pacing of activities, homework assignments, goal setting, and meeting with a role model (A and L). A total of three of the five salutogenic criteria seems to be fulfilled. The SOC increased significantly in the intervention group ( $n = 38$ ) compared to the control group ( $n = 11$ ) at 12 months' follow-up.

A one-year follow-up study (Fagermoen et al., 2015) among 68 persons with morbid obesity with the SOC as primary outcome consisted of a patient education course over a period over 9–12 weeks that consisted of 40 hours. The intervention was grounded in cognitive behavior theory and emphasized the participants to discover resources and

strengthening self-image (A, L, and SRRs). It included lifestyle changes, individual action plans, guided reflections, self-help groups, and physical activity (L, SRRs, and WPA). A total of four of the five salutogenic criteria seems to be fulfilled. The results revealed a significant improvement in the SOC after one year.

Another follow-up study (Langeland et al., 2013) among 254 adults with psoriasis with SOC as the primary outcome was a study on 3-week climate-therapy patient education (healthy lifestyles) and sun treatment. The program consisted of both sun treatment and education (SRRs). Patients received, on average, 80 hours of sun therapy during the stay. Sun exposure was scheduled for each individual per skin type and UV index. Patients were encouraged to bathe frequently in saltwater and to use moisturizing creams. A dermatologist, nurses, and physiotherapist monitored patients and provided individual and group-based education, guidance, and daily training (A and L). The teaching program contained information/dialogue about psoriasis pathogenesis, manifestations, comorbidity, quality of life, and treatment options. The importance of lifestyle choices was emphasized, with a particular focus on physical activity and healthy eating (SRRs). Discussions in smaller groups focused on finding ways to manage psoriasis in daily life. A total of three of the five salutogenic criteria seems to be fulfilled. The results showed positive development of the SOC from before to after the intervention and after three months.

This section included five RCTs, four controlled clinical trials, and two follow-up studies. One of the RCTs (Malm et al., 2018) had a significant effect on the SOC at 12 months follow-up. This study has the strongest design with a good sample size, has a relatively long-term significant effect, and includes a moderate salutogenic intervention. A total of three (Dehnavi et al., 2019; Norrbrink Budh et al., 2006; Odajima et al., 2017), of the four clinical controlled trials, had significant improvements in the SOC. However, these studies have a weaker design and small sample sizes, and the effect was measured from before to after intervention except from the study of Norrbrink Budh et al. (2006) that included a 12 months follow-up and Dehnavi et al. (2019) that had a two months follow-up. Both the follow-up studies (Fagermoen et al., 2015; Langeland et al., 2013) showed significant improvements in the SOC at 12 and 3-months of follow-up, respectively. The studies of Dehnavi et al. (2019) and Fagermoen et al. (2015) had the strongest salutogenic content.

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## Elderly People

An RCT (Arola et al., 2018) among 131 older immigrants with the SOC as a primary outcome included an intervention aimed at creating regular encounters where participants

support one another to make health-supporting decisions in daily life. It consisted of “senior meetings” with follow-up home visits. The meetings were organized by an interdisciplinary group of professionals, where each professional was responsible for one meeting and one follow-up home visit. A written booklet in the participants’ native language supplied written information about health-related issues as a specific resistance resource (SSR). The topics and focus of the meetings were directed by the experiences and needs of the participants, such that the themes varied according to participants’ preferences. This allows participants’ active adaptation (A). The interventions used a person-centered approach and focused on the person as an individual beyond any diagnoses or illnesses and thereby fulfill the criterion of the whole-person approach (WPA). Peer learning was adopted to support the awareness of health resources in daily life among participants. Social support, sharing of knowledge, and experiences about health further provided important resources (GRRs). Peer-learning and home visits created better opportunities for the individual to transfer knowledge in daily life. Thereby the intervention also fulfills the criterion of strengthening the SOC by learning processes (L). This program thus fulfills four of the five criteria of a salutogenic intervention.

The study found a significant change in the intervention group ( $n = 56$ ) compared to the control group ( $n = 75$ ) at six months and no significant differences between groups 12 months after the intervention.

A second RCT (Ericson et al., 2018) among healthy 32 women (ages 65–70 years) with the SOC as a primary outcome included resistance training (described in Strandberg et al. (2015)) in the intervention. It was conducted for 24 weeks. The exercises performed in the gym were squats, leg extensions, leg presses, seated rows and pull-downs, squat jumps, and core stability exercises. The intervention met two criteria of a salutogenic intervention: it provided access to physical activity and social support (GRRs) and it requested active participation (A). The results showed no significant difference between the intervention ( $n = 14$ ) and control ( $n = 18$ ) group on the SOC from before to after intervention.

Kekäläinen, Kokko, Sipila, and Walker (2018) report on their RCT among older adults with the SOC as a secondary outcome. The 9-month resistance training intervention consisted of different exercises for different muscle groups. In the first phase, all training groups attended supervised resistance training twice a week for three months. For the following six months, they continued training with different frequencies (1, 2, or 3 times per week). This intervention meets two criteria of salutogenic interventions. It provides active involvement of participants (A) and access to GRRs (physical well-being and activity, social contacts). The results revealed significant effects on the SOC in two of the three intervention groups ( $n = 26, 27, 28$  respectively) com-

pared to the control ( $n = 25$ ) group from before intervention to after intervention.

Hourzad, Pouladi, Ostovar, and Ravanipour (2018) conducted an RCT among the elderly with chronic diseases using the SOC as a secondary outcome. The intervention, an empowerment self-management program, lasted eight weeks and aimed at improving participants’ health, preventive behaviors, self-esteem, self-care behaviors, compliance with the long-term use of medication, the understanding of changes (in physical, mental, and social abilities), and the ability to manage stressful events. The intervention included five stages:

1. Self-awareness of changes, personal level of performance, and expectations: Participants evaluated the extent of changes in their physical, mental, and social abilities after retirement. They assessed the status of their performance, autonomy, adaptation to the existing conditions, and support resources, and they determined their expected level of performance after the intervention.
2. Goal setting: Participants defined a set of goals, the available supporting resources, and the possibilities for changing or modifying those resources toward the development of a set of strategies.
3. Planning: Based on the developed goals, a plan was drawn that incorporated the recommendations of the participants, available resources, and the program leader’s expertise in an empowerment model. Stages 1–3 were conducted in two sessions of 45 minutes each.
4. Adjusting physical, psychological, and social structures: The participants were then requested to implement the defined strategies of their plan within six weeks during which the intervention team followed up their progress by phone on a weekly basis. Aims and strategies varied among participants and covered a wide range of topics, such as to learn how to receive timely information from the medical care system on various aspects of their disease, to learn new skills to compensate for their shortcomings, to learn how to handle available resources to maintain their health, to gain new empowerment skills (e.g., pottery, fishing, or other leisure activities), to preserve their role in the family, and to communicate effectively with those around them. In support of the implementation phase, the participants were advised to use the educational booklet and could freely call the intervention team by phone to clarify questions.
5. Evaluation: Program leaders conducted a follow-up evaluation over six weeks to ensure proper implementation of the proposed program and interventions. Participants who did execute less than 40% of the specified measures were excluded from the study program.

This intervention covers four criteria of salutogenic interventions, providing specific and general resistance resources (SRRs, GRRs), active involvement of participants (A), and a learning process (L). The intervention group ( $n = 29$ ) revealed significant improvements in participants' SOC compared to the control group ( $n = 29$ ) in routine care after eight weeks (before to after intervention).

An individually tailored, 12-week strength-power training program was investigated in an RCT (Pakkala et al., 2012) among 60- to 85-year-old people with hip fractures. The SOC was a primary outcome. The intervention consisted of resistance training for 12 weeks, conducted twice a week in a senior gym, and supervised by an experienced physiotherapist. Training intensity was adjusted individually and, when tolerated, increased progressively throughout the training period. The assessment was repeated in weeks 6–8 and training resistance adjusted accordingly. The assessment with the criteria for salutogenic interventions showed that two criteria were met: physical activity and individual support as GRRs and active participation in the intervention program (A). It found no significant differences between the intervention ( $n = 24$ ) and control ( $n = 22$ ) groups from before to after intervention.

An RCT (Sundslø et al., 2014) was conducted with 30 older home-living persons with the SOC as a secondary outcome. The intervention to improve self-care included a meeting with health professionals and additional five telephone talk sessions about self-care. The self-care talks captured topics such as practicing healthy habits, building self-esteem, focusing on the positive, communicating, and building meaning. It addressed GRRs (healthy habits, self-esteem, building meaning), fostered active participation (A), and induced a learning process (L). Accordingly, the intervention met three of the five salutogenic criteria. No significant differences between experiment ( $n = 15$ ) and control ( $n = 15$ ) groups after 19 weeks were found.

The Resource Enhancement and Activation Program (REAP) was investigated in an RCT (Tan et al., 2016) among older people in the community with the SOC as a primary outcome. The intervention included a 12-week (twice-weekly participation) program that was offered at community clubs and senior activity centers. REAP focuses on motivation, personal responsibilities, physical activity, and social and environmental impacts on health behavior. Through REAP, older people could review available external resources (e.g., public and health policies, neighborhood exercise facilities and groups, family and friends) and internal resources (e.g., values, assertiveness, self-efficacy skills). The rating with the salutogenic intervention criteria scored relatively high for this intervention since it addressed four salutogenic criteria: the person as a whole (WPA), fostered active involvement (A), facilitated a learning process (L)

and it provided access to resources (GRRs, SRRs) such as motivation, personal responsibilities, physical activity, and social coherence. It promoted the understanding of external life challenges of older people (e.g., health, dependence care, and death) and the understanding of their personal beliefs, thoughts (e.g., new roles), and emotions (e.g., stress). The results showed significant differences between experiment ( $n = 32$ ) and control ( $n = 32$ ) groups from before intervention to after intervention.

The only intergenerational program related to the SOC (primary outcome) we found was reported in a follow-up study with a control group by Murayama et al. (2015). The intervention educated and engaged senior volunteers in picture book reading projects with preschool and school-aged children in educational settings. The rating based on the criteria showed access to GRRs (significant and meaningful contribution to society, social contacts, emotional and intellectual activation) and an active adaptation of participants (A). It found significant differences between the intervention ( $n = 26$ ) and control ( $n = 24$ ) groups in the SOC after nine months, one year, and two years after the intervention. However, the sample size was limited after two years (intervention group,  $n = 6$ , Control,  $n = 15$ ).

Addressing self-management and following a similar proceeding as Hourzad et al. (2018), the intervention investigated by Musavinasab, Ravanipour, Pouladi, Motamed, and Barekat (2016) was addressed to a group of elderly with cardiovascular disease. The clinical trial conducted by the authors used the SOC as a primary outcome. The intervention (three to four months) consisted of five steps based on the self-management empowerment model. This included self-awareness of changes and an understanding of the levels of performance and expectations of themselves, the individuals, knowledge of changes in physical capacities in psychological and social capacities, the level of adaptation to the current situation, support resources, and the elderly's expectations of themselves (A, L and SRRs). Further, optimum goal setting, enhancing the autonomy to perform self-care behaviors, and improving the individual's understanding and knowledge of the changes in his/her physical, psychological, and social capacities (WPA) were given attention. The intervention fulfilled four of the five salutogenic criteria. The study revealed significant differences between the experimental group ( $n = 50$ ) and control ( $n = 50$ ) groups from before intervention to after intervention.

This section included seven RCTs and two controlled clinical trials. A total of four (Arola et al., 2018; Hourzad et al., 2018; Musavinasab et al., 2016; Tan et al., 2016) of the studies (three RCTs and one controlled clinical trial) fulfilled four of the five salutogenic criteria and all reported a significant effect on the SOC from before to after intervention. The controlled clinical trial (Murayama et al., 2015) fulfilled two



of the criteria and showed effect after two years. However, the sample size was limited after two years and the design was weaker. The RCTs of Kekäläinen et al. (2018), Ericson et al. (2018), and Pakkala et al. (2012) included all two salutogenic criteria, and Kekäläinen et al. (2018) revealed significant effect and the two other no significant effect from before to after intervention. The RCT of Sundsli et al. (2014) included three salutogenic criteria in the intervention and revealed no significant effect on the SOC.

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## Interventions on Other Topics

A follow-up study (Edwards, 2006) among 26 exercisers at health clubs, with the SOC as a secondary outcome. The intervention was physical exercise for two to six months. Regular exercise was defined as meeting the criterion of exercising for an average of 30 minutes a day at least three times a week. The following salutogenic criteria are fulfilled: the GRRs (physical activity), active adaptation (A), and learning (L). The result shows significant improvement in the SOC from before to after intervention.

A follow-up study (Heggdal and Lovaas, 2018) among 108 people with different long-term physical and mental illnesses with the SOC as primary outcome found no significant changes in the total SOC score in the whole sample. The intervention, the Bodyknowledging Program, consisted of seven sessions stretched over four months. Bodyknowledging can be defined as a fundamental process for the development of personal knowledge about one's own body, coping skills, health, and well-being. It was conducted in 3-hour group sessions involving eight to ten persons living with different kinds of long-term conditions or in a 1.5-hour individual format with the same content. The following salutogenic criteria seem included: SRRs, WPA, A and L.

This section, including two follow-up studies, shows two different kinds of studies. Edwards (2006) has a rather simple intervention with a small sample and a rather weak salutogenic content and revealed significant improvement in the SOC. The study of Heggdal and Lovaas (2018) includes a rather strong salutogenic content in the intervention. However, there was no significant improvement in the SOC.

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## Discussion

This scoping review has included 41 intervention studies with SOC as the primary or secondary outcome. We developed and agreed upon five criteria for assessing the extent of salutogenically oriented content in the interventions. In addition, we explored the development of the SOC in all intervention studies.

## The Extent of Salutogenic Content in the Interventions of the Different Studies

The analysis of the salutogenic orientation in the interventions was justified by the assumption that a match between the content of the intervention and the desired outcome will improve the latter (Coster, 2013). The outcome must be sensitive and compatible with the intervention to catch the eventually change among participants. It is reasonable to think that whether the SOC might change depends on the quality of the intervention such as fulfilling the criteria for salutogenic interventions, sample, duration and intensity, and the match with the outcome SOC.

Most of the studies have implemented interventions that have multiple strategies, including many different variables and might be defined as complex interventions (Bleijenberg et al., 2018). Accordingly, the interventions, therefore, represent a broad causal concept, including several elements, aims, and intentions.

Further, most interventions provided several GRRs/SRRs, and there was a broad range of different resources for promoting the SOC: for example, group climate, high quality of social support, physical exercise, sailing, music, cultural activities, relaxation exercises, emotional regulation, increased knowledge and ability to use it, increased meaning in life, the consciousness of and use of internal and external resources, and improved action competence.

Also, the included interventions vary in their topics, target groups, and duration. The longest intervention period was 15 months (Bronikowski and Bronikowska, 2009) and the shortest intervention period was two weeks (Odajima et al., 2017).

All the interventions in the included studies fulfilled at least two of the five criteria to be defined as salutogenic (Cf. Table 20.2). However, only three studies fulfilled all five salutogenic criteria. These studies explicitly describe and include the basic philosophical assumptions, the main concepts, and crucial spheres to keep or promote meaning (Bringsvor et al., 2018; Højdahl et al., 2015; Langeland et al., 2006). All interventions included the criterion of active adaptation. Although many of them did not mention active adaptation explicitly, active adaptation was included due to all interventions requiring active adaptation for people to participate. Had we adopted the criterion more strictly, in the sense that participants have to be allowed to influence the content of the intervention, fewer interventions would fulfill the requested level of active adaptation. The key to active adaptation and learning is that all human beings have to actively adapt to inevitable stressful rich environment and seek for useful inputs that create negative entropy and thus might promote coping (Antonovsky, 1987). All the interventions had a more or less strong focus on GRRs and/or SRRs.

Almost all interventions fulfilled the criteria of learning (L). If the participants experienced load balance or appropriate challenges, learning is key. It has, however, been difficult to assess to what degree participants have experienced appropriate challenges. In all interventions, participants have an active role and adapt, but it is unclear whether they experience load balance or appropriate challenges or overload/underload. The number of dropouts in the different studies might indicate overload. However, to systematically assess dropouts is beyond the scope of this review.

A few studies (Bringsvor et al., 2018; Højdahl et al., 2015; Langeland et al., 2006) have explicitly applied the salutogenic view of stressors that includes that stressors and tension might be salutogenic (Cf. criteria 4), neutral, or pathogenic.

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### Change and Development of the SOC in Different Life Situations

The periods of follow-up measures in the studies reviewed vary remarkably (cf. Table 20.2). A total of 29 of the 41 included studies just include measurements before and after the intervention. The follow-up periods varied between 2 weeks and 15 months. Studies accordingly did not report long-term follow-up measurements. A total of 24 studies report significant improvement in the SOC from before to after intervention. Of these, eight are RCTs (Arola et al., 2018; Arvidsdotter et al., 2015; Forsberg et al., 2010; Hourzad et al., 2018) (Kekäläinen et al., 2018; Langeland et al., 2006; Malm et al., 2018; Nammontri et al., 2013), nine follow-up studies with control group or another intervention group (Bronikowski and Bronikowska, 2009; Dehnavi et al., 2019; Kähönen et al., 2012; Merakou et al., 2019; Murayama et al., 2015; Musavinasab et al., 2016; Norrbrink Budh et al., 2006; Odajima et al., 2017; Sarid et al., 2012), and seven follow-up studies without a control group (Edwards, 2006; Fagermoen et al., 2015; Foureur et al., 2013; Gunnarsson and Bjorklund, 2013; Højdahl et al., 2015; Langeland et al., 2013; Vastamäki et al., 2009).

Further, we have expected that studies that have defined the SOC as the primary outcome would have a higher degree of match between salutogenic content and positive development of the SOC (Coster, 2013). Of the 26 studies that revealed a positive development of the SOC, 14 had the SOC as the primary outcome and 12 had the SOC as a secondary outcome. This might mean that being a primary or secondary outcome does not matter. However, only five studies with the SOC as primary outcome did not find a positive development of the SOC. This issue has to be further explored in future research.

The present review focused on possible changes in the SOC due to interventions. The SOC is conceptualized as a relatively stable, though changeable orientation that – as

a consequence of learning processes – generally improves during life. It may be temporarily weakened or strengthened by major life events. Therefore, the possibility of temporary fluctuation of the SOC has to be taken into account: “If one tries to run short-term interventions the result may be confounded by such interventions” (Lindström and Eriksson, 2010, p.46). This might be true for some of the intervention studies described above, especially the follow-up studies without a control group and with short-time follow-up measures. The most solid intervention studies in this review with follow-ups longer than six months are the RCT studies of Arola et al. (2018), Jensen et al. (2016), Langeland et al. (2006), and Malm et al. (2018). However, only the study of Malm et al. (2018) revealed a significant effect on the SOC at 12 months’ follow-up. The study included a CBT intervention program that consisted of three 2.5-hour group sessions over nine weeks, with four to six AF patients, including spouses. However, the change in the SOC was rather small.

Further, it is important to clarify what is meant by a major strengthening of the SOC. Antonovsky claims that if a substantial number of people experience a given mode of therapy and improve their SOC score by five points on the average “this is not to be sneezed at” (Antonovsky, 1996a, p.176). Moreover, he also suggests that practitioners can arrange for SOC-enhancing experiences and he writes: “This would be true for any therapeutic mode that facilitates a long-lasting, consistent change in real-life experiences that people undergo” (Antonovsky, 1987, p.126). Many of the interventions in the present study revealed significant changes above four points from before to after intervention (cf. Table 20.2). However, only one of the studies with the long-term positive development of the SOC revealed changes above five points (Fagermoen et al., 2015). However, the study of Fagermoen et al. (2015) had no control group.

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### The Effect on Participants’ SOC According to the Interventions’ Salutogenic Orientation

RCT studies based on Antonovsky’s basic salutogenic orientation, in which the SOC is defined as the primary outcome, shows significant improvement will support the assumption that salutogenesis has contributed to the effect. In salutogenic intervention studies, the process that may lead to change the dependent variable, SOC, might, for example, be explained as follows: Through empowering dialogues, based on the salutogenic principles including comprehensibility, manageability, and meaning, with focus on crucial life spheres, resistance resources, and appropriate challenges (balance between overload and underload), the participants may increase their awareness of their potential, their internal and external resources (increased imaginable competence and manageability), and their ability to use them. Thus, they might learn to use salutogenic coping mechanisms more

consciously and move toward more comfortable and creative inner adjustment and growth, productive use of emotional energy, more joy, generosity, and more reciprocal interaction with others. In this way, they may have developed their salutogenic capacity and, subsequently, their well-being.

Several recent in-depth studies have started to shed light on salutogenic processes demonstrating in detail how the activation of GRRs in everyday life contribute to strengthening the SOC (Langeland et al., 2016; Maass et al., 2017). For example, studies have found that incorporating sessions dedicated to self-examination and coping, such as through the use of narrative therapy may strengthen self-identity (Langeland and Vinje, 2013; Langeland et al., 2007). Further, studies show how professionals can improve the “Sense of Coherence” of the people they work with through the dimensions of the Sense *for* Coherence (Meier Magistretti et al., 2019; Meier Magistretti et al., 2016).

Some studies possibly are of special interest because they revealed positive development of the SOC six months or longer after the intervention was completed. The follow-up study of Fagermoen et al. (2015) revealed significant development of SOC 12 months after course completion. The intervention consisted of 40 hours for 9–12 weeks, with a sample of people suffering from morbid obesity. The intervention fulfilled four of the five salutogenic criteria. Further, the follow-up study of Gunnarsson and Bjorklund (2013), about adults with different psychiatric diagnoses, showed a significant positive change in the SOC three years after completed therapy and also included a strong salutogenic content (four criteria) in the intervention. In addition, a prospective intervention study with a control group of (Norrbrink Budh et al. 2006) among patients with spinal cord injury and neuropathic that included 20 sessions over 10 weeks, fulfilled 3 salutogenic criteria. The SOC increased significantly in the intervention group ( $n = 38$ ) compared to the control group ( $n = 11$ ) at 12 months of follow-up. However, the sample sizes were small and the significant difference was mainly due to the decrease of the SOC in the control group.

Furthermore, an RCT (Malm et al., 2018) among atrial fibrillation (AF) patients included a CBT intervention program consisting of three 2.5-hour group sessions over nine weeks. A total of three of the five salutogenic criteria seems to be fulfilled. The study found that the SOC significantly improved in the CBT group after the 12-month follow-up, compared to the TAU group. Murayama et al. (2015) follow-up study with a control group revealed significant differences between the intervention ( $n = 26$ ) and control ( $n = 24$ ) groups in the SOC after three months, one year, and two years after the intervention. However, the sample size was limited after two years (intervention group,  $n = 6$ , Control,  $n = 15$ ). It fulfilled two of the salutogenic criteria.

The two RCT studies (Arola et al., 2018; Langeland et al., 2006) revealed a significant effect from before to after

intervention that lasted for six months. The interventions in these studies had a strong salutogenic content fulfilling respectively four and five salutogenic criteria. However, at 12 months of follow-up, the positive change in the SOC was not significant any longer. It is important, though, to take into consideration the samples of older immigrants and people with long-term mental health challenges, respectively. It is reasonable to believe that these groups need follow-up interventions to keep and/or strengthen the improvement of the SOC.

Most of the interventions fulfill three of the five salutogenic criteria and preliminary we might suggest that it seems that there is not any strong relationship between the extent of salutogenic content and the effect on the SOC. However, we have based our assessment on what has been written about the interventions given and we do not know to what degree this has been implemented and how the participants have experienced the intervention.

Accordingly, we need more studies and knowledge on these issues by performing in-depth interviews among health professionals and participants.

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## Strengths and Limitations

Searches have been performed on different databases twice. To the best of our knowledge, all available English-language papers that fulfill the inclusion criteria have been included.

The present review has included articles in English. This means that papers with intervention studies with the SOC as an outcome in other languages such as German or Polish have been excluded.

Some methodological limitations need to be considered. The outcome of the SOC (cf. Table 20.2, last column) has been reported in different ways in the different studies. Most of the studies report the SOC-scale scores and p-values. However, others report only the change scores (difference) or CI or p-values. The degree of detail and accuracy of the descriptions of the interventions varied among the studies in this overview. Some interventions were explained in detail in a separate paper (cf. Table 20.2). It has also been challenging that the papers do not explicitly describe the content of the control group. Some describe it as treatment as usual and do not clarify what it is. Some do not comment on the control group. Besides, some RCTs and controlled clinical trials do not report whether the experiment group has received the intervention of the control group in addition to the new intervention.

We have assessed the different interventions according to our criteria for salutogenic interventions. To our best knowledge, only a few scholars (Álvarez et al., 2020; Polhuis et al., 2020) have tried to develop criteria, but we believe we have further elaborated existing criteria integrating the theory

and findings of Antonovsky (1987), Langeland et al. (2006, 2007), and Langeland and Vinje (2013).

## Implications for Further Research

This scoping review reveals that we need to further unravel what salutogenic interventions entail and study their effectiveness and develop salutogenic interventions that at least fulfill the five salutogenic criteria. It is reasonable to think that more specific salutogenic interventions, including health promotion aims, are likely to make the SOC and other relevant salutogenic outcomes more sensitive for change.

Also, we need several longitudinal salutogenic intervention studies with larger samples size and stronger research designs such as RCTs to increase the knowledge about the SOC's ability to change in the long run.

## Conclusion

This overview indicates that it is possible to improve the SOC in the whole life course among different groups. Health promotion professionals (Cf. Langeland et al., 2021) should therefore work person-centered and resource-oriented with a focus on the SOC in different challenging life situations and thus arrange for people to come into a positive interplay between different resistance resources and the SOC to improve health (especially mental health) and well-being.

This review also reveals that there is a dearth of longitudinal RCT studies, including salutogenic interventions in the life course with SOC as an outcome. Overall, the chapter indicates that it is possible to improve the SOC in different challenging life situations if pre- and post-intervention states are compared. However, we lack studies measuring long-term outcomes, and we don't know if the progress in strengthening the SOC is long-lasting. The interventions aiming to strengthen the SOC seem to comprehend at least three qualities: they facilitate access and use of GRRs and/or SRRs, they foster active adaptation of participants, and they induce a learning process. To strengthen the salutogenic content, it is important to also include the whole person approach (WPA) and that stressors and tension (ST) might be potentially health-promoting.

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