

Suicidal Threat in Patients Admitted to Acute Wards in Mental Health

Care:

Examining the Value of Sense of Coherence

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1 Supervisor: Roar Fosse

2 Supervisor: Henrik Natvig

Abstract

We explored Antonovsky's concept of sense of coherence as a possible helpful tool in assessing suicide risk in patients admitted to acute wards in mental health care. The stability of sense of coherence (SOC) from hospitalization to follow-up time was explored in a secondary pilot investigation. Method: Participants were 31 patients admitted to an acute ward and 32 normal healthy participants. A partly different sample of 27 patients participated in a follow-up procedure of SOC, with the first scoring at the ward and the second at follow-up 3 to 12 months following discharge. Participants completed measures of sense of coherence (SOC-13) and suicidality (SUAS-S). Results: Total scores on SOC-13 and SUAS-S showed a strong, negative correlation ($r = -.82, n = 63, p < .001$) in the combined sample of admitted patients and the control group. Significant correlations between SOC-13 and SUAS-S were found separately within each of the patient group ($r = -.60, n = 31, p < .001$) and the control group ($r = -.58, n = 32, p = .001$). SOC levels for patients at hospitalization and at follow-up were not significantly correlated, but there was a significant increase in scores from hospitalization (mean 44.3, SD = 13.9) to follow-up (mean 54.4, SD = 15.4), paired sample *t*-test, $t(1, 26) = 2.7, p < .05$. Conclusion: SOC may be a helpful tool in the assessment of suicidality in patients at acute wards. The lack of stability in SOC over time in patients questions Antonovsky's theoretical assumptions of SOC as a stable phenomenon, as well as the use of SOC as a predictive measure of suicidal risk following discharge.

Introduction

Suicide is a relatively common phenomenon in most countries in the world, reflecting not only suffering for those afflicted, but also concern for health professionals, politicians and the public in general. According to Statistics Norway (2009), the suicide rate was 10.3 per 100,000 in 2007, 14.3 for men and 6.3 for women. Suicide risk is generally associated with mental health problems, in particular depression, but also personality disorders, bipolar disorder and schizophrenia (Mortensen, Agerbo, Erikson, Qin, & Westergaard-Nielsen, 2000; Harris & Barraclough, 1997). According to Qin & Nordentoft (2005), more than 90% of all people who complete suicide have a mental health diagnosis. The association between mental disorder, life crisis and suicidality is seen particularly clear in patients who are admitted to acute wards in mental health care, where about forty percent of patients are at risk (Walby, Odegaard, & Mehlum, 2006; Pirkis & Burgess, 1998). Several studies in Scandinavian countries indicate that suicide risk is elevated at several stages of an acute ward enrolment; the first week, the last week and in particular the first 1-2 weeks after discharge (Mortensen et al., 2000; Qin & Nordentoft, 2005). In attempting to prevent such suicide, mental health care is in need of better ways to identify those at risk.

Whereas suicidality may reflect a multiplicity of causes, acute ward treatment of suicidal patients focuses both on reducing the relevant crisis, stabilizing the patient, and planning appropriate follow up care. In planning follow up care, a crucial point is to estimate the patient's possible suicide level following discharge. Traditionally, this is done by combining various risk factors in the patient's life with clinical descriptions (Petrie & Brook, 1992; Cochrane-Brink, Lofchy, & Sakinofsky, 2000). However, suicide following discharge still occurs at relatively high rates. Qin and Nordentoft (2005) reported risk ratios of 102.0 times for men and 246.0 times for women the first week after discharge, and Mortensen et al. (2000) reported an incidence risk ratio of 341 for those who had been discharged less than a week ago, highlighting the need to develop better prediction instruments for suicidal behavior following discharge.

Various measures have been developed for estimating the level of suicidality in patients admitted for treatment in mental health care services. Range and Knott (1997) conducted a review of 20 suicide scales and reported that the scales varied widely in length, type of items, reliability, validity, target age group and how it should be administered. Each

scale has a variety of advantages and disadvantages, and Range and Knott recommended the Beck Suicide Series (SSI, SSI-M and SSI-SR), the Reasons For Living series (RFL) and the Suicide Behavior Questionnaire (SBQ and SBQ-C), depending on the group of people to be assessed. However, they concluded that although some instruments show better results than others, none of the instruments can adequately substitute clinical judgment (Range & Knott, 1997). Cochrane-Brink et al. (2000) reviewed five suicide scales for use in a clinical setting: the Modified SAD PERSONS Score (MSPS), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Beck Hopelessness Scale (BHS), Beck Scale for Suicidal Ideation (BSS) and High-Risk Construct Scale (NEW). They found that the BSS was the best instrument of the five, but also emphasized that the scales would probably be of most help to inexperienced professionals and in assisting decisions on referral to psychiatric care (Cochrane-Brink et al., 2000). Thus, it seems suicide assessment scales might not be invaluable in assessing suicidal ideation and behavior in a clinical setting.

When wanting to assess future suicidality in patients enrolled at an acute ward, direct measures of suicidality like those investigated by Range & Knott (1997) and Cochrane-Brink et al. (2000) are problematic due to a known, substantial variability of the level of suicidality over time. In an attempt to develop more stable predictors of suicidality, researchers have focused on instruments that may assess more basic phenomena that may underlie suicidality, such as basic existential characteristics, coping patterns, and self efficacy (Edwards & Holden, 2003; Petrie & Brook, 1992). Investigating how patients deal with their problems in general terms over time can bring us closer to predicting future suicidality since once a patient is discharged from hospital, he or she must manage their life without the secure frames an acute ward can offer. Petrie & Brook (1992) suggested that prediction of suicidal threat could be improved by inclusion of variables promoting adjustment.

One widely used scale that focuses on existential characteristics is the Sense of Coherence Scale, created by Antonovsky (1987) to measure the concept of Sense of Coherence. In Antonovsky's theory of salutogenesis (Antonovsky, 1979, 1987), a basic tenet is that stress and difficulties are essential elements of being human (Olsson, Hansson, Lundblad, & Cederblad, 2006), and that the true question is how anyone survives for any length of time, not how they become sick or die (Antonovsky, 1993). He pointed out how inadequate he finds the pathogenic orientation, where the focus is to find the factors that lead to different diseases (Antonovsky, 1993). He therefore proposed a new orientation,

salutogenesis, where the focus is to identify the underlying factors of health and see how humans cope with the stress and difficulties of life (Olsson et al., 2006). Antonovsky believed wellness-illness should be seen as a continuum, and that the salutogenic perspective of health promotion encompasses an examination of where each individual is on this continuum (Olsson et al., 2006).

Sense of Coherence (SOC) is the central concept in this theory and it consists of three components. ‘Comprehensibility’ refers to whether or not inner and outer stimuli make sense to us. That is, if the stimuli are coherent, ordered, cohesive, structured and clear. ‘Manageability’ refers to a feeling of how resources are at our disposal in order to meet the demands given by the stimuli we are exposed to. ‘Meaningfulness’ refers to how we see life’s difficulties. They can be perceived as challenges in which we can apply energy, engagement and dedication, or they can be seen as burdens that we want to avoid. In other words ‘meaningfulness’ is the motivational aspect of SOC (Olsson et al., 2006). According to the theory of salutogenesis, SOC is assumed to characterize basic existential traits that are stable over time, and to be fully developed and thus more stable after maturation (Antonovsky, 1987; Feldt et al., 2003; Lindström & Eriksson, 2005). This assumption has been supported by studies of the general population, showing only small variations in a person’s SOC score over time. Considering greater time spans, correlations are weaker, indicating that SOC might be varying across the life span (Lindström & Eriksson, 2005). In the book *Unraveling the mystery of health* (1987) Antonovsky presented a questionnaire for the measurement of SOC in people. This is now known as SOC-29, also termed Orientation to Life Questionnaire by some researchers (Breslin, Hepburn, Ibrahim & Cole, 2006; Feldt, Leskinen, Kinnunen & Ruoppila, 2003). Antonovsky simultaneously presented a shorter version of the scale, SOC-13. There have been many other versions of SOC presented by different researchers, however, the original SOC-13 and SOC-29 scales continue to show the highest validity (Antonovsky, 1993; Eriksson & Lindström, 2005). SOC-29 scores ranges from 29 to 203 and SOC-13 scores ranges from 13 to 9. In Antonovsky’s review article (1993) he reported that a Finnish adult sample of men had a mean score of 150.2 (SD = 21.9), and women 146.1 (SD = 22.7) on SOC-29. Polewka et al. (2001) reported that the norm score in the Polish population was 139. With regard to SOC-13 Antonovsky (1993) reported that U.S. university faculty men scored 66.7 (SD = 9.8) and women 66.4 (SD = 10.6). In a general Swedish population

mean scores for SOC-13 were 64.52 (SD = 11.03) in a 1993 sample and 65.31 (SD = 10.64) in a 1995 sample (Larsson & Kallenberg, 1999).

Previous research shows that Sense of coherence as measured with the SOC scale generally is lower in people with mental health problems than in the general population. Chimich & Nekolaichuk (2004) found that depressed elderly had significantly lower SOC-13 scores (49.4) than elderly without depression (64.9). Using correlation analysis in a general population study, Larsson & Kallenberg (1996) found a significant $r = 0.44$ correlation between psychological well-being and SOC for men ($n=976$) and an $r = 0.52$ correlation for women ($n=1027$). They also reported a linear trend across all symptoms; the lower the SOC, the higher the level of symptoms of mental health problems. In a review of existing studies, generally lower SOC scores were found for clinical groups as compared to normal groups (Hansson & Olsson, 2001). These findings support the basic tenet of salutogenesis that sense of coherence is a phenomenon closely related to mental health in general.

Some studies have linked SOC to suicidality. Among male conscripts, Mehlum (1998) found a mean SOC-13 score of 59.5 (SD=11.6). He found a statistically significant difference between the group of suicide ideators ($n=127$) having a mean score of 51.9 (SD=11.3), and the group of non-ideators ($n=519$) having a mean score of 61.5 (SD=10.5). Giostakos (2003) conducted a similar study on Greek male conscripts, and found that subjects with suicidal ideation or behavior showed significantly lower mean scores on the SOC-13 scale than the whole sample. Mean SOC-13 score for the whole sample ($n=1098$) was 59.8 (SD=10.8) and mean SOC-13 score for subgroups of suicidal ideation and behavior varied from 48.3 (SD= 11.3) to 53.6 (SD= 10.5). Along the same lines, young Finnish men tested at military call-up showed decreasing SOC-scores with increasing levels of mental health problems. Participants with no mental health problems had a mean SOC-13 score of 69.3 (SD=9.7), while participants with mild mental health problems had a mean score of 61.9 (SD=10.1), and those with moderate to severe mental health problems a mean of 50.0 (SD=10.9). The Finnish study also reported that the use of mental health services was associated with lower SOC scores, and that those with a mental health diagnosis had lower SOC scores than those without a diagnosis (Riskari et. al., 2005). These three studies link SOC empirically to suicidality, but the conclusions are limited to groups of young male conscripts. The lack of a female perspective and variety in age present a possibility that the differences can be explained by the situation these young men found themselves in.

A small group of studies have reported an association between SOC and suicidality in mental health care patients. Petrie and Brook (1992) used computerized interviews to investigate the predictive value of hopelessness, self-esteem, depression and SOC upon suicidal ideation. An *F* test showed that the SOC variable explained a significant amount of variance in suicidal ideation over and above self esteem, hopelessness and depression ($F(3,143) = 5.60, p < .01$). In a multiple regression analysis predicting suicidal ideation at six months, only SOC among the variables was significant, with an overall R^2 of 22 per cent, which dropped to 15 per cent when SOC was removed ($F(3,107) = 3.01, p < .05$). In a Polish study, Polewka et al. (2001)¹ investigated patients hospitalized for suicide attempts. They reported significantly lower SOC-29 scores for suicide attempt groups (first time attempters had a mean score of 99, $SD = 30.06$ and repeated attempters had a mean score of 112, $SD = 26.02$) compared to the general Polish population (mean score of 139). Toshiko, Eisuke, Kana, Eriko, and Akihiko (2005) conducted a similar study in Japan where suicide attempt again were found to be significantly related to SOC scores².

Given prior positive findings linking SOC to both mental health in general and to suicidality, we used this construct as the starting point to investigate existential factors that might underlie suicidality in patients enrolled at an acute ward in mental health care. Complicating this endeavor are the known problems involved in defining and assessing suicidality as such. Several attempts have been made to identify one single core aspect of suicidality, such as pessimism, hopelessness, the presence of suicidal thoughts, and the presence of self destructive acts. Although several scales are widely used, such attempts have not produced decisive evidence. Existing scales also have shown weaknesses in detecting variations in the level of suicidality over time (Niméus, Alsén & Träskman-Bendz, 2000; Niméus, Ståhlfors, Sunnquist, Stanley, & Träskman-Bendtz, 2006). As an alternative Stanley and co-workers (Stanley, Träskman-Bendz, & Stanley, 1986) constructed the suicide assessment scale, SUAS, which attempts to establish a general score for suicidality based upon the use of a multidimensional approach covering five problem areas: affect, bodily states, control and coping, emotional reactivity and suicidal thought and behavior (Niméus et

¹ Polewka et al. (2001) was published in Polish, but the abstract and tables were in English. Repeated attempts to reach the authors with questions have failed.

² Toshiko, Eisuke, Kana, Eriko, and Akihiko (2005), was published in Japanese, only the abstract was in English. The authors have not responded to our questions.

al., 2000). In creating the SUAS scale, three criteria were used as the basis: 1. Measure both observed and reported symptomatology associated with suicidality. 2. No association with a specific diagnosis. 3. Sensitivity to changes in suicidality over time (Niméus et al., 2006). A self-rate version of the suicide assessment scale (SUAS-S) has recently been created (Niméus et al., 2006).

Within the frame of wanting to establish a measure able to predict both present and future suicidal behavior, we focused on the relationship between SOC and suicidality while the patients were admitted to the acute ward. We reasoned that if a strong relationship could be found between SOC-13 and SUAS-S in the ward, this would provide the basis for subsequent studies of the predictive value of SOC for suicidality following discharge. This question is complicated by the relatively limited amount of studies that have addressed the association between SOC and suicidality in general. In particular, very few studies have assessed this link in people with severe mental health problems. A second complicating matter is the difficulty of obtaining a reliable and valid assessment of the existing level of suicidal danger in acutely ill patients.

Further, we wished to start investigating SOC in relation to future suicidal threat. A prerequisite for using SOC as an instrument to predict suicidality following discharge is that this phenomenon has at least a moderate level of stability over time also for patients in an acute phase of mental illness. In particular, if SOC is not stable from the acute phase to a follow-up time, this would seriously question the ability of the phenomenon to give rise to a predictive measure of suicidal risk following discharge. It would also challenge Antonovsky's basic conception of SOC as a stable phenomenon and suggest the need to reconsider this view in terms of a dependence of SOC on a person's general state of mental health at a given point in time. The stability of SOC over time has to our knowledge not been investigated for people with serious mental health problems, such as patients admitted to a psychiatric acute ward due to life crisis or high levels of illness symptoms. In this study, we mainly focused on whether SOC is a helpful tool in assessing suicidality in patients admitted to an acute ward. However, since stability of SOC in this setting is a crucial matter, we felt it necessary to start addressing this issue. Within the limited time frame of this master study, we thus chose to launch a pilot investigation of this question by addressing whether SOC in inpatients in the acute phase would be similar to that found at follow-up time.

In order to investigate our main research question, the relationship between SOC and suicidality in patients at the acute ward, we chose to include not only participants with a high level of suicidality but also aspired to include patients with a varying degree of suicidal thoughts and behaviour. By securing a relatively broad variation within the group, we assumed that the association between the measures at stake better could be addressed and detected. Following this same line of reasoning of obtaining a large variation in the measures, we also included a group of participants assumed to be normally healthy, without any expected risk of suicide. The inclusion of this group also served the goal of linking our study to the main body of evidence in the literature on SOC, which refers to normal healthy people or people with milder psychological difficulties than those typically admitted to an acute ward. With regard to our secondary research question, we chose to only include patients, as our focus was to perform a preliminary investigation of the stability of SOC within this group.

Our main research question thus was that SOC is a helpful tool in the assessment of suicidal threat in patients admitted to an acute ward in mental health care, reflected by a substantial correlation between SOC and SUAS in our participant group. Additionally, we wanted to start investigating the question of whether SOC is a stable trait in acutely ill patients from the hospital stay to a follow-up time.

Method

We studied the relation between SOC and level of suicidality in a combined sample consisting of patients admitted to the acute ward of division of mental health, Asker and Baerum State Hospital, and staff working at the same hospital. The two participant groups were combined to obtain a broad variation in (assumed) level of suicidality in order to facilitate the detection of a possible association to SOC. The secondary question of the study, whether SOC is a stable phenomenon or not in patients in an acute mental health crisis, was investigated using patients-only from the acute ward. The study considered both SOC and level of suicidality as phenomena that vary on continuous dimensions, as opposed to a discrete, categorical fashion. With this starting point, we based the analysis on the use of correlation and regression analysis to investigate the association between variations along the continuous dimensions of the instruments in the participant groups. In this pilot study, we paid no main attention to the specific mental health problems of the patients, instead investigating the association between the phenomena of the study for patients admitted to an acute ward at large.

Participants

Participants were patients at an acute ward in a Norwegian mental health care hospital and employees at two different Norwegian mental health care hospitals. The patients at the acute ward mainly consist of people with affective disorders, schizophrenia, and different psychoses, also related to drug abuse. Inclusion criteria were admittance to the acute ward and ages from 18 to 70. Exclusion criteria were organic brain injuries, mental retardation, psychosis or psychotic symptoms, and other reasons that a patient might be unfit to participate. At the acute wards there is an average of about 2 new admittances per day (646 in 2008). The data collection in the wards went over approximately 6 months of the year, and a total of 78 patients participated in some part of the study, which means the participants of this study were nearly 25 % of the admitted patients. Employees at the acute wards who were responsible for a patient would evaluate how fit a patient was to participate. Most of the patients who were invited to participate accepted the invitation. Three declined the invitation and five left the acute ward before the interview could take place. Some patients completed only SOC-13. The sample for our first hypothesis consisted of altogether 63 participants, 29

male and 34 female with 31 participants from the acute ward patient population (14 male and 17 female) and 32 participants from the normal healthy group (17 male, 15 female). The mean age in the overall sample was 39.6 years (SD = 11.3 years), with no significant age difference between the patient group (mean 36.6, SD = 12.9) and normal healthy group (mean 41.3, SD = 10.1); independent sample *t*-test, $t(1, 61) = 1.3, p = .17$). Of altogether 78 patients who completed the SOC-13 while admitted at the ward, SOC-13 for the follow-up point was sent out to 47 patients who had reached the follow-up time. Of these 27 patients (57.4 %) responded to the follow up letter and returned a new scoring on SOC-13, thus comprising our sample for the second hypothesis.

We used two partly different samples to investigate (1) the relationship between SUAS-S and SOC-13 and (2) the relationship between SOC-13 time one T1 and SOC-13 time two T2. The reason for the difference in samples was because SUAS-S was demanding to complete, thus SOC was administered to more patients than SUAS-S. This study has been approved by regional committee of research ethics and by the data inspectorate.

Instruments

Sense of Coherence Scale. We used the SOC Scale 13 item version (SOC-13; Antonovsky, 1987) to measure SOC. The items on the SOC-13 scale are answered on a 7-point semantic differential scale. The total score on the instrument ranges from 13 to 91. SOC-13 has been tested several times on reliability and validity (Antonovsky, 1993; Hanson & Cederblad, 1995). Bengtsson-Tops and Hansson (2001) tested a sample of schizophrenic persons and their results supported the construct and predictive validity of SOC-13. Antonovsky (1993) reported Cronbach's alpha ranging from 0.74 to 0.91 in SOC-13 in an array of studies. In a review article including over 450 scientific publications Eriksson and Lindström (2005) found Cronbach's alpha ranging from 0.70 to 0.92 in SOC-13. Hansson and Olsson (2001) found Cronbach's alpha on average to be 0.88. The SOC scale has been translated to 33 languages and has been used in 32 countries all over the world. Thus, it seems to be a cross culturally applicable instrument (Lindström & Eriksson, 2005).

Several previous studies have used Norwegian versions of SOC-13. However, the procedures for translating SOC into Norwegian in these studies were not described in the subsequent articles. We thus translated the SOC-13 into Norwegian by having three English-

speaking Norwegians translate the questionnaire as presented in Antonovsky's book *Unravelling the mystery of health* (1987). The three versions were compared and through discussion and consensus in the group, a common version was decided upon. A professional Norwegian – English translator back-translated this to English. A different group of clinicians compared the new English version, the original version and the Norwegian version. A final Norwegian version was decided upon through discussions and consensus in this group (appendix a).

Suicide Assessment Scale. We used the suicide assessment scale self-rating version (SUAS-S; Niméus et al., 2006) to measure suicidality. SUAS-S consists of 20 items, which each contain five statements ranging from 0 to 4. The score ranges from 0 to 80, with 80 being the highest level of suicidality. Using a Swedish translation of SUAS-S, Niméus et al. (2000) found that SUAS could significantly differentiate suicide victims from the matched controls, which was not the case with the rating scales in comparison (MADRS, Beck Hopelessness Scale and the Suicide Intent Scale). SUAS-S is available in Swedish and English (Niméus et al., 2006). The validity of SUAS-S has been tested by correlating the scores from patients' self-ratings to those given by a senior psychiatrist using the SUAS interview version. A significant correlation (Spearman's $\rho = 0.82$, $P < 0.01$) was found between the total scores on the two scales (Niméus et al., 2006).

SUAS-S was available in a Norwegian translation at the National center of suicide prevention. However, we were not given permission to use this scale. We thus translated SUAS-S from the neighboring language, Swedish, into Norwegian through a the following process: Three Norwegians translated the scale into Norwegian, followed by a back-translation to Swedish by a native Swede, which then was compared to the original Swedish version from Niméus et al. (2006). Finally, we used three different clinicians to decide upon a final consensus version of the Norwegian SUAS-S following standard procedures (appendix b).

Procedure

Participants were asked to participate on a volunteer basis, and received both written and oral information about their rights to withdraw at any time during the study. Informed consent was collected. The participating patients were also informed that choosing to participate or not had no effect on the treatment they would receive at the hospital. The participants in the control group were informed that their participation would not affect any area of their employment.

The instruments were presented during interviews with the patient group. A researcher read the questions and recorded the answers. Some patients chose to complete the scales as self report questionnaires with the researcher present. The control group received the scales as anonymous self report questionnaires. Due to the sensitivity in the questions, the SUAS-S was administered following SOC-13. For follow up scoring in the patient group, SOC-13 was sent by mail to participants 3-12 months after the initial participation. The names and addresses were only known to an employee at the hospital. The participants were offered two FLAX lottery tickets for returning a completed SOC-13 by mail. A prepaid envelope was provided as well as informed consent.

Based on research that have reported gender differences (Antonovsky, 1993; Edwards & Holden, 2001) we wanted to see whether gender had an effect upon the association between SOC and SUAS by using gender and SOC scores as independent variables and SUAS scores as dependent variable in regression analysis. Using the enter method, no significant effect was found for gender ($p = .59$). We thus continued using the simpler Pearson r analysis in the remainder of the analyses.

Results

The mean SOC-13 score for the patient group was 44.7 (SD = 12.6) and for the control group 70.0 (SD = 10.3). The mean SUAS-S score for the patient group was 36.6 (SD = 15.7) and for the control group 3.7 (SD = 3.7). When comparing the two participant groups, SUAS-S scores were significantly lower in the control group, $t(1, 32) = 11.4$, $p < .001$. In this analysis, we used adjusted degrees of freedom due to unequal variances in the two groups (Levene's test for equality of variances, $F = 36.9$, $p < .001$). When comparing SOC-13 scores between the two groups, significantly lower scores were found in the patient group, $t(1, 61) = 8.8$, $p < .001$. The opposite difference in SUAS-S and SOC-13 between the control and patient group illustrates how increasing SOC-13 scores are associated with decreasing scores on suicidality (Figure 1).

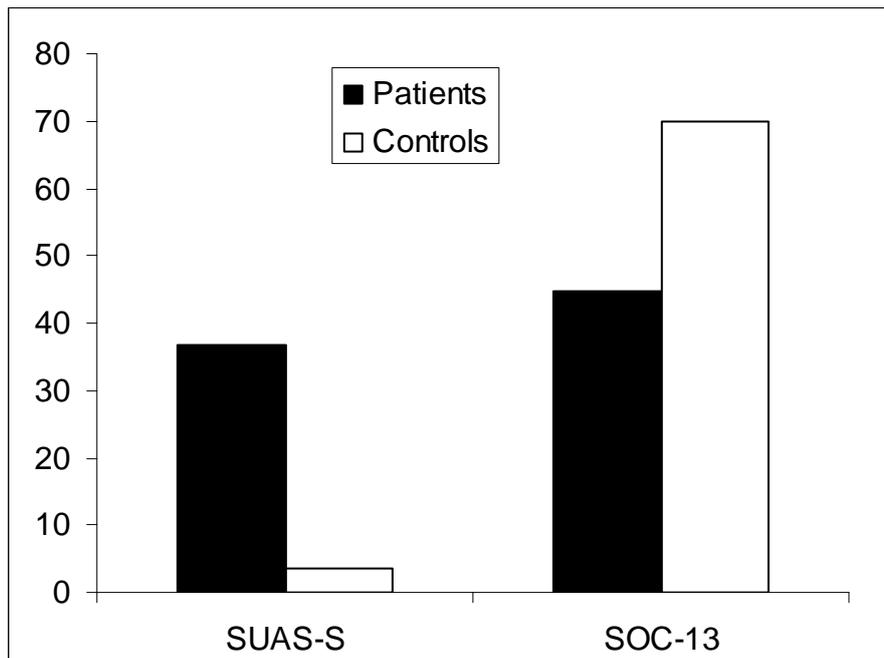


Figure 1 Contrast between SUAS-S and SOC-13 with respect to group differences

The relationship between individual scores on SUAS and scores on SOC are illustrated in figure 2. There was a strong, negative correlation between the two variables, $r =$

$-.82, n = 63, p < .001$, with high levels of SOC being associated low levels of suicidality. A significant negative association between SOC and suicidality was also found within each of the patient group, $r = -.60, n = 31, p < .001$, and the control group, $r = -.58, n = 32, p = .001$ considered separately.

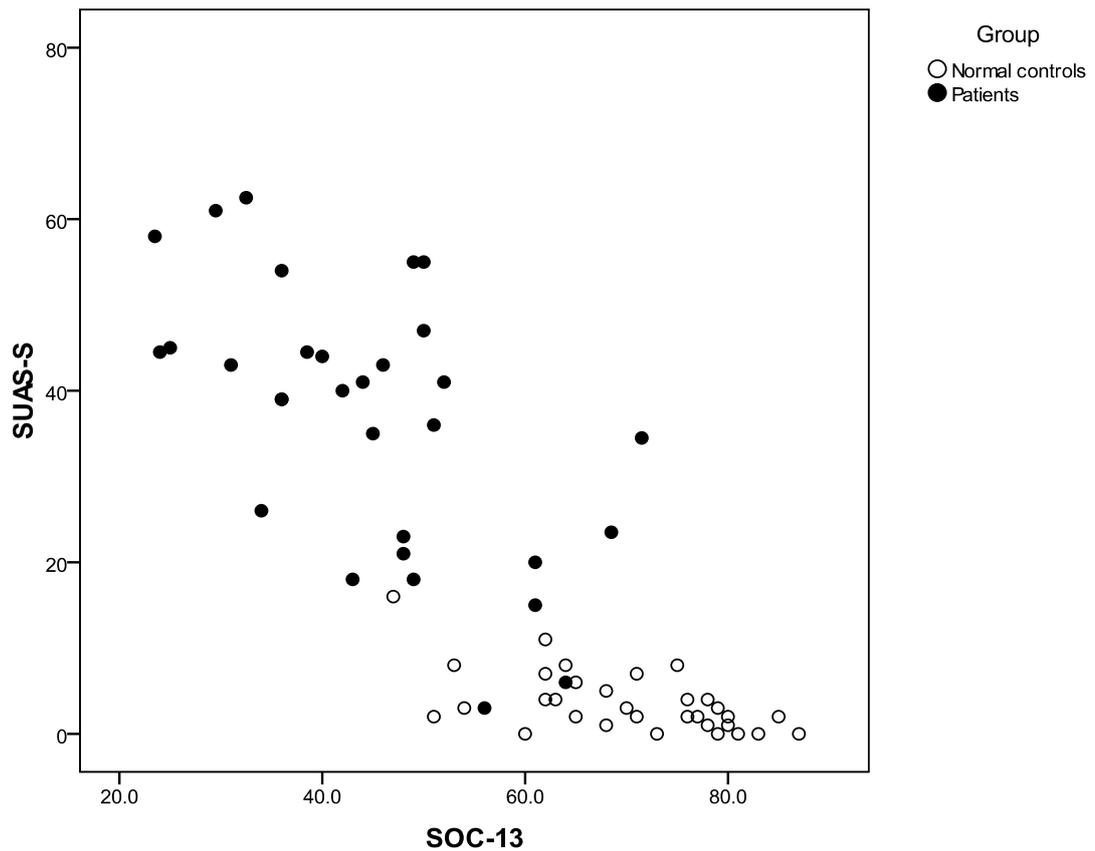


Figure 2 Association between individual scores on SOC-13 and SUAS-S

As indicated in figure 2, the relationship between SOC and SUAS may not be linear but rather curvilinear, with SUAS scores remaining low over an interval of the highest SOC scores, then increase rapidly as SOC scores fall below a level of about 55-60. Curve estimations using regression analysis suggested that a cubic relationship may be the most appropriate, accounting for 69.6 % of the shared variance between the variables, $F(3, 59), R^2 = 0.696, p < .001$. However, the gain in variance accounted for was not as substantial when

compared to the linear association assumed in Pearson r analysis, which could account for 67.2 % of the shared variance.

We then analysed the secondary question of whether SOC is stable over time in patients admitted to an acute ward. Within the group of 27 patients with SOC-13 scores at both the ward and follow up, there was a very low, non-significant correlation between the SOC-13 scores at the two time points, $r = .11$, $n = 27$, $p = .60$ (figure 3). Comparing SOC-13 scores at the two time points, a significant increase was found from the stay at the ward (mean 44.3, SD = 13.9) to follow up (mean 54.4, SD = 15.4), paired sample t -test, $t(1, 26) = 2.7$, $p < .05$.

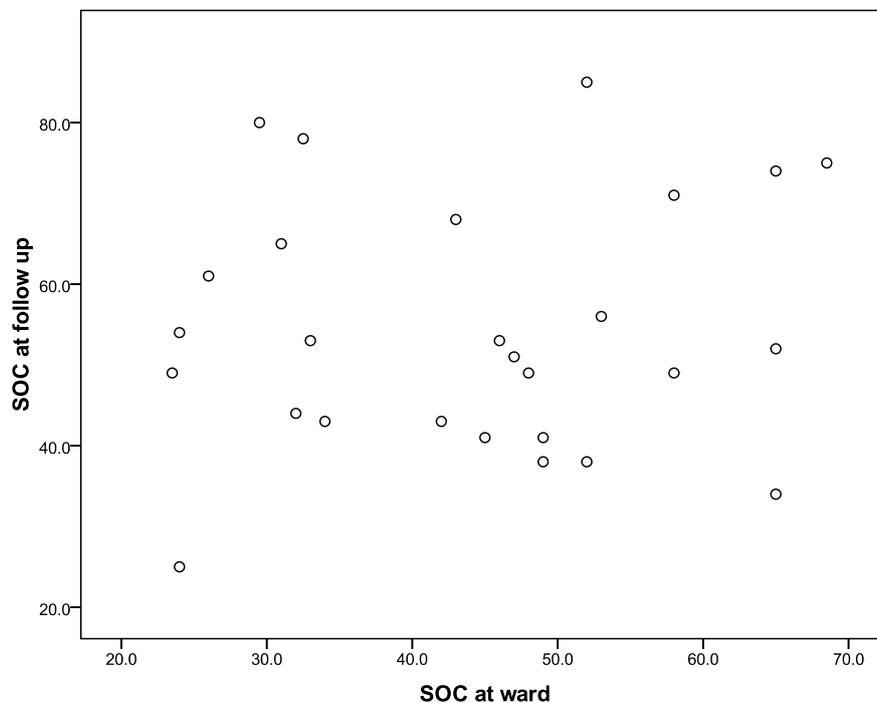


Figure 3 Association between SOC at two time points in a patient participant group

Discussion

In this study we aimed to investigate the relationship between SOC, measured by SOC-13 (Antonovsky, 1987), and suicidality, measured by SUAS-S (Stanley et al., 1986; Niméus et al., 2006) in a participant group that included patients admitted to an acute ward in mental health care and normal healthy people. The patient group showed significantly lower SOC-13 levels than the control group, whereas the control group had significantly lower SUAS-S scores than the patient group. This suggestion of an opposite, inverse relation between SOC and SUAS when comparing the two participant groups was reflected in the correlation between SOC and SUAS in the entire sample considered together, which was strongly negative. Thus, increasing levels on SOC were associated with decreasing levels of suicidality, and the two measures shared a substantial 67.2 % of their variance. SOC and SUAS had moderately strong, significant, negative correlations also within each of the patient group and the control group, strengthening the conclusion of a relationship between these measures and the phenomenon they reflect. Our pilot investigation of the stability of SOC indicated that this measure was not stable in patients at the acute wards between the time of hospitalization and follow-up 3-12 months later. This was reflected by a lack of correlation in SOC within the patients as measured at the two time points and a significant change (increase) in SOC scores at the group level from hospitalization to follow-up.

The strong, negative correlation between SOC and SUAS overall indicates that the SOC concept can be used to address the phenomenon of suicidality. The moderately strong correlation between SOC and SUAS within the patient group indicates a possible value of SOC in assessing suicidal threat in patients at acute wards of mental health care that will need further investigation in future studies. The moderately strong correlation between SOC and SUAS within the control group indicates that this connection between SOC and SUAS is not only worth examining in groups of mental health care patients, but possibly also for a general population.

Of particular relevance to our study, in a Polish investigation, Polewka et al. (2001) investigated patients hospitalized for suicide attempts. The patient groups were hospitalized for suicide attempts by drug intoxication, and are thus slightly different for our sample. The authors reported significantly lower SOC scores for the suicide attempt groups compared to the general Polish population and concluded that SOC might be useful in determining

repeated suicide attempts (Polewka et al., 2001). Toshiko, Eisuke, Kana, Eriko, & Akihiko (2005) conducted a similar study in Japan where participants were acute ward patients. They found that suicide attempt were significantly related to SOC scores, and that the greater the subject had developed his/her psychiatric disease, the lower was their SOC score. Our findings are in line with the findings in these studies, however both these studies are published in non-western languages so further discussions of the findings were not possible, Further corroborating the possible value of SOC in addressing suicidality, significant differences have been found in SOC scores between other types of participant groups reporting suicidal ideation or behavior and groups without (Mehlum, 1998; Giostakos, 2003). These studies reported significant differences between SOC scores in groups of participants with suicidal ideation or behavior, with mean SOC scores varying from 47.8 to 53.6 between studies, as compared to groups of non-ideators, with mean scores varying from 59.8 to 67.8 (Mehlum, 1998; Giostakos, 2003; Riskari et al., 2005). Our findings are of the same character as these, but with a larger difference between the mean score of the groups. This may be due to how the samples differ in level of mental health and age. Young Finnish men tested at military call-up showed decreasing SOC-scores with increasing levels of mental health problems. The Finnish study also reported that the use of mental health services was associated with lower SOC scores, and that those with a mental health diagnosis had lower SOC scores than those without a diagnosis (Riskari et al., 2005). Furthermore, in a review of existing studies, generally lower SOC scores were found for clinical groups as compared to normal groups (Hansson & Olsson, 2001). This array of findings is in accordance to our results and strengthens the use of SOC as a measure to address suicidal risk in various groups of people, including patients in mental health care.

The lack of correlation in SOC from the acute state to follow-up suggests that SOC is not a stable phenomenon in acutely ill mental health patients. The increase we found in SOC levels indicates that SOC levels change in accordance with the patient's mental health and in accordance with decreasing suicidal threat, which could be due to treatment. This finding clearly needs to be corroborated using a larger sample as well as other and complementary measures of patient functioning, and in our study, this conclusion is weakened by the high drop out rate at follow up. In investigating stability of SOC in the normal population, in a review, Eriksson and Lindström (2005) concluded that SOC is fairly stable over time, but not as stable as Antonovsky assumed. Perhaps the stability of SOC should be considered to be

relative and to depend on a person's mental health status. In line with this suggestion, Hakanen, Feldt & Leskinen (2007) found that SOC levels were relatively stable in participants with high SOC scores, but unstable in participants with low SOC scores. Likewise, Feldt et al. (2003) found that SOC in a group of healthy people was lower at the time of a national financial crisis than 5 years later when the economy was better. This might indicate that crisis can influence SOC levels. Similar findings of situation dependent scores on SOC were reported by Geyer (1997). Being admitted to a mental health care acute ward mirrors a major personal crisis, and this might explain the low SOC levels we found in our patient group. The lack of a significant correlation that we found could perhaps be explained by the fact that some patients get better after treatment, while others do not respond that well. A further investigation of SOC in relation to other measures after treatment could provide insight on this.

The lack of stability in SOC over time in our findings questions the use of the SOC instrument as a useful measure to predict suicide risk following discharge, but instead of using SOC as a predictive measure, one might consider whether SOC rather could function as an outcome measure, reflecting the phenomenon of a person's current mental health status rather than predicting it. Indeed, this view is consistent with findings from previous studies that patients with mental health problems have lower levels of SOC than in the normal healthy population (Hansson & Olsson, 2001; Petrie and Brook, 1992; Polewka et al., 2001; Toshiko et al., 2005).

Method comments

Should one use first-person instruments (self evaluation) or third-person instruments (clinician evaluation)? Arguments exist pro and contra the use of both types of measures. In this study, we used the first-person approach to measure both SOC and suicidality. A main reason for this choice is that, as the baseline situation at a ward, clinicians usually perform third-person assessments of patient functioning, including suicide danger based on their clinical judgement, often supplemented by a few targeted questions. The patient's own perspective, when addressed using validated instruments, might yield additional information in such a situation, which would, if successful, validate the introduction of formal instruments that put extra demands upon both the patient and the administrative logistics of the ward. The

moderate-to-high correlations between SOC-13 and SUAS-S we found both in the overall sample and in the patient group separately suggest that a first-person measurement approach may be used for patients admitted to an acute ward of mental health care. It appears that both normally healthy people and patients in acute mental health care may be able to assess and report both their level of SOC and their level of suicidality.

It is not clear from our study whether the lack of a perfect correlation between SOC-13 and SUAS-S reflects a true imperfect correlation between the two phenomena, issues of validity associated with either of the instruments, or problems with using the first person measurement approach such as a reduced level of insight. It is noteworthy that we found a similar level of correlation between SOC-13 and SUAS-S within the patient group considered separately as we did for the normal healthy group considered separately. One interpretation of this similarity in the association of the measures in the two participant groups is that acutely ill patients do not stand back from a healthy group of people in their ability to self-evaluation on these measures. If this is the case, first hand measures such as SOC and SUAS could possibly be included in assessment and treatment of patients in acute mental health care.

A limitation of this study is its small sample size, in particular the relatively few patients we managed to include. This was due to the nature of the sample and the time frame of this study. Acute ward patients are a very vulnerable group and extreme care must be taken in order to avoid causing any harm. Interviews were done only when employees at the acute ward approved, and care was taken to make sure the patients knew this was on a volunteer basis, that it had no effect on the treatment they received and that they could withdraw at any time. Interviews also had to be scheduled to a time when the patients felt well enough to participate, and outside of the times when they had appointments with psychiatrists, psychologists and others taking part in their treatment. Not all patients were willing to participate and not all were found capable of participating. Future studies should be performed within a larger time frame to include a larger number of participants.

Only about half of the patients provided follow-up scores of SOC-13, resulting in a particularly small sample in the testing of stability of SOC over time. This was due to obvious time constraints and to a high drop-out rate. A larger sample size is clearly needed to provide

a better estimation of the stability of SOC over time following discharge, limiting the conclusions that can be based on this analysis.

The study was based on instruments used in international research, which not previously had been translated into Norwegian using accepted translation methods. We thus translated the instruments using such methods, for use in this study. The use of both instruments would be strengthened if the study was preceded by a validation study of the translated versions. Further studies are needed in Norwegian participant groups, to validate the instruments by the simultaneous use also of other instruments that may address the constructs that SOC and SUAS aim to measure.

Implications and conclusions

The aims of this study was to investigate the relationship between SOC and suicidality, and determine if SOC was a stable trait as Antonovsky claimed, and thus evaluated whether SOC might be worth investigating for predictive value in relation to suicidal threat. This study added further empirical evidence to SOC as a helpful tool in the assessment of suicidality for patients admitted to an acute ward. The lack of stability in SOC over time in our study challenges Antonovsky's theoretical basis, indicating that there are aspect of his theory in need of better definitions and more empirical evidence. The lack of stability in SOC over time for these patients undermines the possible predictive value of SOC as a measure of suicidality, but the significant increase in SOC scores over time could be indicating that SOC is related to change in mental health.

SOC was created to measure how people view the world in relation to how they make sense of things, how they feel they are equipped to deal with things, and how they perceive difficulties. Relating this to a mental health setting, SOC could, regardless of stability over time, still prove useful in terms of suicidality. SOC might add valuable insight into how patients manage problems of suicidality at the moment of measurement, and thus indicate how to address their treatment. Some research has evaluated the value of different types of existential measures, among them SOC, in relation to suicidal threat, and have found that measures of coping, life meaning and other existential issues could be useful (Edwards & Holden, 2001; Petrie & Brook, 1992). Dieserud, Røysamb, Braverman, Dalgard and Ekeberg (2003) concluded that participants who reported low self efficacy and had negative views of their capacity to solve problems had a higher risk of repeating suicide attempts than

participant who reported higher levels. Investigations of SOC in relation to measures like these are needed.

The correlations we found between SOC and SUAS were not perfect, in particular not within the patient group when studied separately, which might limit the value of using SOC to inform about suicidal risk in patients admitted to an acute ward. However, with more data of the kind we collected, it might be possible to establish cut-off scores on SOC, where scores below a certain SOC level could provide the clinician at an acute ward with an indication of a possibly high suicide risk.

For further research we suggest a thorough exploration of the stability of SOC in samples of people with mental health problems through longitudinal studies and larger samples. An exploration of SOC levels in different groups of patients within mental health care would be appropriate in order to explore SOC levels and stability of SOC in different samples. The three dimensions of SOC could be investigated separately in order to determine whether one of them is better correlated to SUAS-S than the others. We also suggest that further research explore how the concept of SOC can add useful information for clinicians about their patients, above the clinical information they otherwise are able to obtain, and how this can help in the treatment of these patients. The strong correlation we found between SOC and suicidality in our sample indicates that SOC might be a helpful tool to assess suicidal threat in acutely ill patients in mental health care. Due to indication of a lack of stability over time SOC may have a limited value to predict suicidal threat following discharge from an acute ward. Further investigations of this could explore SOC levels in relation to change in a patient's mental health at follow-up. If this lack of stability could be reproduced in future research, it would question one of the basic notions of Antonovsky's theory.

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Appendix A

SOC-13

	1	2	3	4	5	6	7
1 Har du hatt følelsen av at du egentlig ikke bryr deg om det som foregår rundt deg? *	Svært sjelden eller aldri						Svært ofte
2 Har du noen gang blitt overrasket over oppførselen til folk du trodde du kjente godt?*	Aldri skjedd						Alltid skjedd
3 Har det skjedd at mennesker du stolte på har skuffet deg? *	Aldri skjedd						Alltid skjedd
4 Hittil har ditt liv vært preget av	Ingen klare mål eller mening i det hele tatt						Svært klare mål og mening
5 Har du hatt følelsen av å bli urettferdig behandlet?	Svært ofte						Aldri
6 Har du hatt følelsen av å være i en ukjent situasjon og ikke vite hva du skal gjøre?	Svært ofte						Svært sjelden eller aldri
7 Dine daglige gjøremål er *	En kilde til dyp glede og tilfredsstillelse						En kilde til smerte og kjedsomhet
8 Har du hatt svært blandede følelser og ideer?	Svært ofte						Svært sjelden eller aldri
9 Har det hendt at du har følelser du helst ikke ville hatt?	Svært ofte						Svært sjelden eller aldri

10 Mange mennesker, selv de med sterk personlig het, føler seg noen ganger som ”tapere” i visse situasjoner. Hvor ofte har du følt deg slik? *	Aldri							Svært ofte
11 Når noe har skjedd, har du stort sett følt at	Du har overvurdert eller undervurdert viktigheten av det							Du vurderte tingene på riktig måte
12 Hvor ofte har du følt at dine daglige gjøremål har liten mening?	Svært ofte							Svært sjelden eller aldri
13 Hvor ofte har du følelser du ikke er sikker på om du kan kontrollere?	Svært ofte							Svært sjelden eller aldri

* Reversed items

Appendix B

Examples of SUAS-S items

1. Humør

0. Jeg kan være både glad og trist, alt etter omstendighetene.
1. Jeg er for det meste positiv og glad, men har også perioder med nedstemthet.
2. Jeg er ofte nedstemt, selv om lysere stunder forekommer.
3. Jeg er nesten alltid nedstemt og fortvilet, og gode stunder forekommer sjelden.
4. Mitt liv er helt ødelagt av dyp fortvilelse.

12. Selvtillit

0. Jeg har god selvtillit.
1. Enkelte ganger kan jeg miste troen på mine egne evner. Jeg klarer imidlertid å ta meg sammen.
2. Til tross for at jeg som oftest stoler på meg selv, har jeg en tilbakevendende følelse av mislykkethet og usikkerhet når det gjelder mine egne evner.
3. Jeg føler meg alltid verdiløs og mislykket og tviler på at det kan bli bedre.
4. Jeg er helt mislykket og verdiløs, og det finnes ingen bedring.

19. Betraktninger om å ta sitt eget liv

0. Jeg har ingen selvmordstanker.
1. Hvis jeg skulle begå selvmord, så skulle det være en hevn for gamle urettferdigheter, men jeg har bedre løsninger.
2. Hvis jeg begikk selvmord ville det vekke en berettiget oppmerksomhet hos andre.
3. Hvis jeg begikk selvmord så ville det løse vanskelige problem som jeg ikke ser noen annen løsning på.
4. Et selvmord ville innebære en etterlengtet befrielse og hvile, både for meg og for mine omgivelser.