

【Original Article】

Relationship between Sense of Coherence and Stress Coping Strategy in Nursing Students: Changes Before and After Clinical Training

Kyoko SUGA¹, Chizuyo USAMI², Yumiko OGURO², Chisako SAKAKIBARA³, Norio ISHII⁴¹ Faculty of Nursing, School of Health Science, Fujita Health University² Public Kasugai Komaki Nursing College³ Dept. of Nursing, Faculty of Human Science, Hokkaido Bunkyo University⁴ Aichi Kiwami College of Nursing

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Summary

The aim of this study was to clarify differences in sense of coherence (SOC) before and after clinical training and differences in stress coping strategies between groups with high and low SOC, assuming that there are differences in the process of SOC formation depending on the strength of SOC. The subjects were third-year students in a three-year course at a nursing vocational school. SOC, TAC-24, and STAI were measured before and after clinical training in the final stage of basic nursing education, and the relationships between trends in students in the high and low SOC groups and anxiety trends and stress coping strategies were investigated. It was found that although students in the low SOC group tended to be constantly susceptible to stress, their SOC score rose after the clinical training ($t(12)=-4.00, p<.01$). In addition, while the low SOC group tended not to actively use stress coping strategies before the clinical training, after the training a tendency was seen for the low SOC students to flexibly select coping strategies, similar to the high SOC group. (Med Biol **155**: 424-432 2011)

Key words: SOC, TAC-24, stress coping strategy, clinical training

Introduction

Clinical training in basic nursing education is an important learning process during which the fundamentals of practical nursing skills are acquired, and long-term clinical training is incorporated into the nursing education curriculum. In clinical training, students gain proficiency in nursing practices that integrate the nursing knowledge, skills, and attitudes learned in the classroom. During this training, they form the ability to build assistive relationships with patients and to fulfill the roles and duties of a professional nurse. In this process, however, there are many difficulties that must be overcome and conflicts

with their own abilities, and students often feel tension and anxiety that they had not previously experienced. From the results of surveys of stressors in nursing students, it has been reported that stressors increase in clinical training together with reports and tests,¹⁾ and that in clinical training high stress levels occur with concern about training records, reports, and human relationships with faculty members and clinical training instructors.²⁾ Physical effects have also been reported in clinical training, including decreased immune function caused by stress³⁾ and decreased appetite in people who feel high stress.⁴⁾

However, deepening their learning while coping

well with stress in clinical practice also leads to personal growth for nursing students. The basic ability needed for this is sense of coherence (SOC). SOC is a core concept in the theory of health generation, systematized by Antonovsky as a constructive theory of stress coping ability.⁵⁾ Antonovsky states that stressors exist everywhere, and that, depending on how one copes with tension from stress, stressors may also become a source of personal growth. SOC mobilizes coping resources (generalized resistance resources) accumulated in the individual, and helps them in dealing with stressors or the tension caused by them. The success or failure of stress coping depends greatly on the abundance of generalized resistance resources and the strength of SOC, and people with strong SOC are able to cope flexibly with stressors.⁶⁾ In previous studies of nursing students it has been reported that students with weak SOC tend not to actively use coping strategies,⁷⁾ that SOC softens the effect of stressful life events on mental health,²⁾ and that students with strong SOC have better mental health than those with weak SOC.⁸⁾

Formation of SOC in nursing students is necessary to raise the growth and learning effect of the students. SOC is formed through the experiences of successfully coping with stress and a good quality of life. While clinical training is seen as a stress factor for many nursing students, it is also an important learning process in basic nursing education. Meeting various people and developing relationships, overcoming various conflicts and difficulties, and feeling joy or a sense of worth in nursing can be experiences of a good quality of life that strengthen SOC.

In a previous longitudinal study we conducted in students in a nursing junior college, there was no change in SOC over three years as an overall trend in students.⁹⁾ In the present study we hypothesized that there is a difference in the SOC formation process in people with originally strong or weak

SOC. The subjects were third-year students in a three-year course at nursing vocational school, and changes in groups with high and low SOC were investigated from the relationship between SOC, state of anxiety, and selection of stress coping strategy before and after clinical training, which is the final stage of basic nursing education.

Methods

Subjects

The subjects were 33 nursing students (male 1, female 32) in the third year of a three-year course at a nursing vocational school, who consented to participate in the study.

Survey methods

Anxiety, SOC, and TAC-24 as a stress coping strategy were measured using questionnaires six months before the start of clinical training (pre-training), which is the final stage in basic nursing education, and at the end of 12 months after the end of training (post-training) in the subjects.

1) Anxiety scale

The Japanese version of the State-Trait Anxiety Inventory (STAI) by Spielberg et al. was used. A-State shows the state of anxiety at the time of the survey, and A-Trait shows the susceptibility to anxiety as a character trait. Each consists of 20 questions with responses on a scale of 1 to 4. The responses of 1 to 4 for each question are totaled, and higher total scores for A-State and A-Trait show stronger tendencies for anxiety.

2) SOC

For SOC, a Japanese language scale¹⁰⁾ developed by Yamazaki based on the SOC scale proposed by Antonovsky was used. This SOC scale consists of 29 questions on three subscales: comprehensibility, manageability, and meaningfulness. Responses to each question are scored 1–7, and higher total scores indicate higher stress coping and health maintenance abilities; in other words, people with strong SOC. However, scores that are too high are called rigid SOC, and indicate a problem of a lack

of flexibility or accommodation.

3) TAC-24

The Tri-Axial Coping Scale¹¹⁾ (TAC-24) was used to measure stress coping. TAC-24 is a three-dimensional summary measure by Kamimura et al., in which they theoretically arranged many previous scales. The TAC-24 has a total of 24 questions and consists of subscales on three axes (1: problem focus – emotional focus, 2: involvement – avoidance, 3: cognition – behavior). Responses of 1–5 are given, with higher total scores indicating higher coping strategies. It is a scale that is mainly be applied to general adults.

Statistical analysis

Subjects were divided into two groups of high and low SOC based pre-training SOC score. JavaScript-STAR version 5.5.7j was used in the analysis, with a significance level of less than 5% taken to indicate statistical significance.

Ethical consideration

The following were explained to subjects orally and in writing, and return of survey forms was taken to indicate consent to cooperate in the study.

- 1) Study aims and methods.
- 2) That participation in the study was voluntary, and that they would incur no disadvantage in school life or grades if they declined to participate.
- 3) Surveys would be conducted multiple times, but subjects had the right to withdraw at any time. In such cases, they would incur no disadvantage whatsoever.
- 4) Findings would be used for the purposes of the study only and submitted for conference presentations and submissions to academic

journals, but personal information would be strictly protected.

Results

SOC

Pre-training SOC scores are shown in Table 1. To enable comparison, 25 students (all-female) from whom both pre-training and post-training data could be obtained were the subjects in the analysis. Subjects were divided into high and low SOC groups centered on the mean pre-training score.

In a comparison of overall SOC scores before and after training there was a tendency for higher scores after training, but no significant difference was seen ($t(24)=-1.88, p<.10$). Comparisons of pre- and post-training scores in each group showed no significant difference in the high SOC group, but a significantly higher post-training score was seen in the low SOC group ($t(12)=-4.00, p<.01$).

TAC-24

The mean score for each scale before and after training is shown in Table 2. The subjects for analysis were 26 students (all female) for whom both pre- and post-training data could be obtained. A comparison of before and after training showed a significantly lower stress coping strategy of “abandonment/resignation” after training ($t(25)=2.16, p<.05$). In addition, although no significant difference was seen in “planning,” the post-training score was higher ($t(25)=-1.77, p<.10$).

Relationship between SOC and each scale

The relation between SOC and STAI or TAC-24 was analyzed in 11 subjects in the high group

Table 1. Mean SOC scores

	SOC		
	All (n=25)	High group(n=12)	Low group (n=13)
Pre-training	118.64 ± 16.75	132.83 ± 12.11	105.54 ± 6.83
Post-training	123.72 ± 17.26	133.33 ± 18.32	114.85 ± 9.94

Significance probability + $p<.10$ * $p<.05$ ** $p<.01$

and 11 subjects in the low group (all females, for whom data for all surveys were available.

1) SOC and STAI

The mean STAI scores are shown in Table 3. To investigate the relation between anxiety and SOC in students before and after training, an analysis of variance was done with a 2-factor mixed design of SOC high and low groups (2) × pre- and post-training (2) for A-State and A-Trait, respectively. There was no significant difference in A-State in either interaction or main effect. In A-Trait there

was no significant difference in interaction, but a significant difference was seen in main effect between the groups. The score was higher in the low SOC group than in the high SOC group ($F(1,20)=8.48, p<.01$).

2) SOC and TAC-24

The changes in stress coping strategy before and after clinical training in the high and low SOC groups were compared (Table 4). In the high SOC group, “planning” was significantly higher after the training ($t(10)=-2.51, p<.05$). In the low SOC

Table 2. Mean scores on each scale of the TAC-24

(n=26)

	Information gathering	Abandonment /resignation	Positive interpretation	Planning	Avoidance thinking	Leisure	Catharsis	Shifting responsibility
Pre-training	10.19 ± 2.69	8.77 ± 1.99	10.08 ± 2.04	9.04 ± 2.08	9.50 ± 2.26	10.31 ± 2.97	12.00 ± 2.66	7.53 ± 2.82
Post-training	10.42 ± 2.19	7.54 ± 2.08	10.27 ± 2.35	10.04 ± 2.03	9.23 ± 1.97	10.92 ± 2.25	12.12 ± 2.45	6.77 ± 2.21

Significance probability + $p<.10$ * $p<.05$

Table 3. Mean STAI scores

	A-State		A-Trait	
	Pre-training	Post-training	Pre-training	Post-training
High SOC group	48.36 ± 7.51	46.45 ± 9.36	48.09 ± 5.45	47.55 ± 7.38
Low SOC group	52.00 ± 5.39	50.27 ± 5.19	56.36 ± 5.71	53.09 ± 5.60

Table 4. Comparison of TAC-24 before and after training

		Pre-training	Post-training	t-value	Significance probability
High SOC group	Information gathering	10.82	11.18	0.27	ns
	Abandonment/resignation	8.45	7.27	1.43	ns
	Positive interpretation	11.18	10.90	0.56	ns
	Planning	9.82	11.00	9.00	*
	Avoidance thinking	9.45	9.00	0.35	ns
	Leisure	11.36	10.82	0.09	ns
	Catharsis	12.45	12.55	0.56	ns
	Shifting responsibility	6.36	6.45	0.48	ns
Low SOC group	Information gathering	10.18	9.73	0.35	ns
	Abandonment/resignation	9.00	7.73	2.01	+
	Positive interpretation	8.91	9.55	-0.89	ns
	Planning	8.36	9.09	-0.64	ns
	Avoidance thinking	9.45	9.73	-0.48	ns
	Leisure	8.73	10.82	-1.72	ns
	Catharsis	11.18	11.45	-0.32	ns
	Shifting responsibility	8.73	6.27	2.70	**

Significance probability + $p<.10$ * $p<.05$ ** $p<.01$

group, “shifting responsibility” was significantly lower ($t(10)=2.70, p<.05$) and “abandonment/resignation” tended to be lower ($t(10)=2.01, p<.10$).

To investigate the relation between strength of SOC and stress coping strategy, an analysis of variance with a 2-factor mixed design of SOC high and low group (2) × TAC-24 subscale (8) was conducted for before and after training, respectively.

Interaction was significant before training ($F(7,140)=2.91, p<.01$), and “positive interpretation” and “leisure” were significantly higher in the high SOC group (positive interpretation: $F(1,140)=8.05, p<.05$, leisure: $F(1,140)=4.94, p<.05$). “Shifting responsibility” tended to be higher in the low SOC group ($F(1,140)=4.94, p<.10$). In selecting a stress coping strategy, the high SOC group was significant but in the low SOC group although a trend was seen it was not significant (high group: $F(7,140)=1.92, p<.05$, low group: $F(7,140)=8.13, p<.10$). The results of multiple comparison using the LSD method ($Mse=5.0039, p<.05$) showed that in the high SOC group “shifting responsibility” was lowest, and “abandonment/resignation” was

lower than “information gathering,” “positive interpretation,” “leisure,” and “catharsis.” In the low group, “catharsis” was lower than “abandonment/resignation,” “positive interpretation,” “planning,” “leisure,” and “shifting responsibility” (Fig. 1).

After training, interaction was not significant, but a trend was seen ($F(7,140)=2.00, p<.10$). For the simple main effect of stress coping strategy, “planning” was significantly higher in the high SOC group ($F(1,140)=7.36, p<.05$). In both the high and low SOC groups there were differences in selection of stress coping strategy (high group: $F(7,140)=18.20, p<.01$, low group: $F(7,140)=11.01, p<.01$). The results of multiple comparison using the LSD method ($Mse=2.7205, p<.05$) showed that in the high SOC group “shifting responsibility” was lowest, followed by “abandonment/resignation” and “avoidance thinking,” and in the low SOC group “shifting responsibility” was lowest followed by “abandonment/resignation” (Fig. 2).

Discussion

The mean pre-training SOC score in the subjects in this study was 118.64 ± 16.75 , about the same as the mean score of 119.7 ± 19.9 reported by

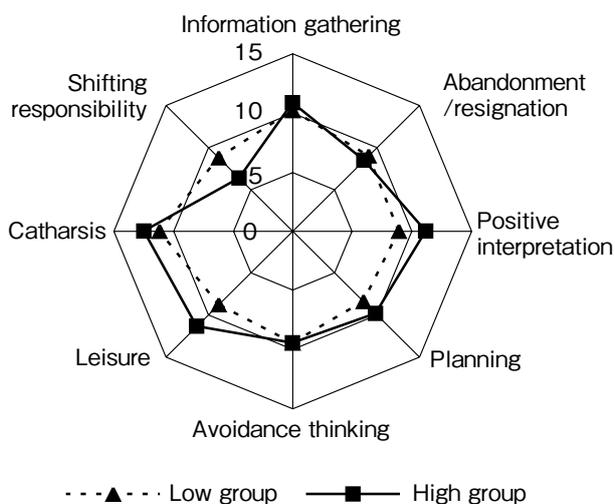


Figure 1. Comparison of stress coping strategy (TAC-24) before training in high and low SOC groups

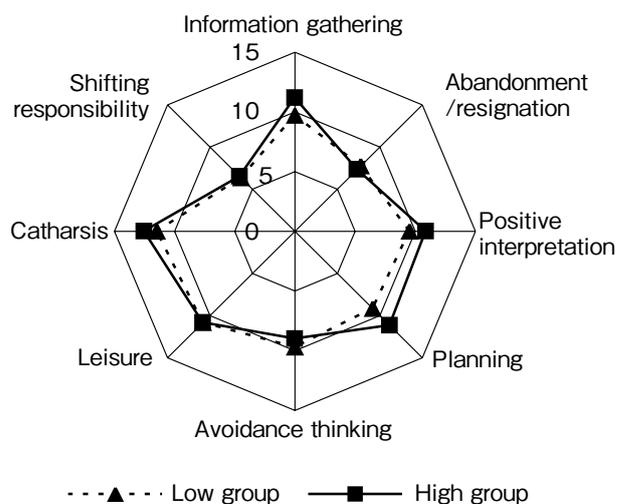


Figure 2. Comparison of stress coping strategy (TAC-24) after training in high and low SOC groups

Inoue et al. in 2nd to 4th year nursing university students²⁾ and 117.14 ± 22.80 we reported before clinical training in 3rd-year students in a nursing junior college.⁹⁾ However, after training SOC tended to be stronger at 123.72 ± 17.26 . In the low SOC group in particular the score was significantly higher after the training. In a survey of nursing junior college students by Hongo et al., there was an obvious increase in SOC following clinical training in a low SOC group,¹²⁾ and a similar result was obtained in the present study. This suggests that for students with the weakest original SOC, the experiences in clinical training are related to the formation and growth of SOC.

The mean pre- and post-training STAI scores of students exceeded the reference values for high anxiety in both A-State and A-Trait (A-State: women 42, A-Trait: women 45). There were no differences in A-State between the high and low groups, but the low SOC group had higher A-Trait, which shows susceptibility to anxiety. A previous study reported a high correlation between SOC and A-Trait,³⁾ and the present study supports this. Since there was no difference before and after clinical training, anxiety was not necessarily relieved after the end of clinical training, and a state of high anxiety was seen to continue. That tendency was particularly pronounced in the low SOC group, and with the exception of one subject after clinical training, A-Trait showed a state of high anxiety in all subjects both before and after clinical training. Students in the low SOC group, who have a high tendency to be susceptible to anxiety, tended to still have high anxiety after the clinical training, even though SOC was stronger. Together with formation and development of SOC, the accumulation of experiences of coping well with stress is thought to gradually relieve states of high anxiety.

A difference was seen in stress coping strategies before and after the training. As an overall result, tendencies were seen for “abandonment/

resignation” to decrease after training and for “planning” to increase. This shows a tendency for change from avoidance coping, which tended to be selected for problems before training, to a coping strategy of actively trying to resolve the problem after the training.

In a previous study we reported that there is a relation between SOC and stress coping strategy, but there was no change in the eight scales of TAC-24 before and after training in third-year students of a nursing junior college.⁹⁾ However, in the present study a change was seen in stress coping strategy before and after training. In the previous study, the fact that there was no difference in SOC before and after training is thought to have influenced this difference in results.

Before training a difference in stress coping strategy was seen in the high and low SOC groups. It is conjectured that, compared with the low SOC group, the high group had significantly higher “positive interpretation” and “leisure,” actively engaged problems, took leisure appropriate to the situation, and worked to maintain mental stability while avoiding problems.

Different tendencies were also seen in the stress coping strategy selected. The high SOC group did not often use “responsibility shifting” or “abandonment/resignation,” and adopted behaviors to deal with stressors by “information gathering,” “positive interpretation,” and “catharsis.” However, when control was judged to be difficult, there seemed to be a tendency to try to gain emotional stability by avoiding the problem with “leisure” behavior. The low SOC group, in contrast, showed a tendency not to adopt active stress coping strategies. The tendency for “catharsis” alone to be higher than the other factors suggests that, more than actively trying to solve problems, they attempted to gain emotional stability by telling their troubles to someone.

After training, the SOC group used the “planning” coping strategy more often. In a

comparison before and after the training, it is thought from the higher use of “planning” after training by the high SOC group that they more often adopt the behavior of engaging stressors and trying to resolve problems through their experiences in clinical training.

After training the high and low SOC groups showed about the same tendencies in selected stress coping strategies in which differences were seen from before training. In the low SOC group, “shifting responsibility” decreased after training. A tendency was also seen for “abandonment/resignation” to decrease. As a result there was a tendency to use coping strategies other than “shifting responsibility” or “abandonment/resignation,” similar to the tendency in the high SOC group. This suggests that the low SOC group, who before training coped with stress by avoiding responsibility for problems by placing it elsewhere, or avoided it from the start by thinking there was nothing they themselves could do, after training came to be able, like the high SOC group, to select coping strategies to either resolve the problem or stabilize emotions by engaging stressors, adopting behaviors to try and resolve problems, or avoiding problems when appropriate to the situation.

People with strong SOC can select and implement appropriate coping strategies flexibly and relatively quickly depending on the stress situation, while people with low SOC cannot cope well with stress situations and become anxious. However, the present study suggests that for students with weak SOC clinical training is one factor in the formation and development of SOC. Since SOC is formed through experiences of successfully coping with stress and a good quality of life, clinical training is considered to be a meaningful experience for students. Support for students and arrangement of the learning environment so that they can predict to some extent the events they will face, and have the confidence to somehow get through them, are

tasks for faculty members and clinical training instructors.

Conclusion

- 1) In the high SOC group there was no difference in SOC score before and after the final clinical training for third-year students, but in the low SOC group the SOC score increased significantly after training.
- 2) STAI A-Trait score was higher in the low SOC group than in the high SOC group, and there was no difference before and after training. The low SOC group in particular showed a pronounced tendency to be in a state of high anxiety whichever time period measurements were made.
- 3) Before the start of clinical training differences were seen in the selection of stress coping strategy and the way that strategy was used in the high and low SOC groups. After the clinical training the low SOC group came to be able to flexibly select a stress coping strategy, similar to the high SOC group.

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Correspondence address:Kyoko SUGA
Faculty of Nursing, School of Health Science, Fujita Health University.
1-98 Dengakugakubo, Kutsukake-cho, Toyoake, Aichi, 470-1192, Japan
TEL : 0562-93-2530
E-mail : suga@fujita-hu.ac.jp

看護学生における首尾一貫感覚の形成とストレス対処方略との関連 —臨地実習前後の変化の検討—

須賀京子¹、宇佐美千鶴代²、小黒由美子²、榊原千佐子³、石井成郎⁴

¹ 藤田保健衛生大学医療科学部看護学科

² 公立春日井小牧看護専門学校

³ 北海道文教大学人間科学部看護学科

⁴ 愛知きわみ看護短期大学

要 旨

本研究は、SOC : Sense of Coherence の強度によって、SOC 形成の過程に違いがあることを仮定し、SOC 高群と低群間での臨地実習前後の SOC やストレス対処方略の違いを明らかにすることを目的とした。3 年課程看護専門学校の 3 年生を対象とし、看護基礎教育最終段階の臨地実習前後で SOC、TAC-24、STAI を測定し、SOC 高群および低群の学生の傾向と、不安傾向やストレス対処方略との関係を検討した。その結果、SOC 低群の学生は常にストレスを受けやすい傾向を持っているものの、臨地実習後に SOC 得点が上昇した ($t(12)=-4.00$, $p<.01$)。また SOC 低群は、実習前にはストレス対処方略を積極的に用いていない傾向にあったが、実習後には SOC 高群と同様に柔軟にストレス対処方略を選択する傾向が見られるようになった。

キーワード : SOC、TAC-24、ストレス対処方略、臨地実習

連絡先 : 須賀京子

藤田保健衛生大学医療科学部看護学科

愛知県豊明市沓掛町田楽ヶ窪 1 番地 98 (〒 470-1192)

Tel: 0562-93-2530 Fax: 0562-93-4595

E-mail: suga@fujita-hu.ac.jp

