



**Factors Predicting Work-Related Sense of Coherence of Nurses  
in Affiliated Hospitals of Kunming Medical University, China\***  
**ปัจจัยทำนายความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานของพยาบาลในโรงพยาบาล  
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### Abstract

Work-related sense of coherence (Work-SoC) is an important factor for promoting nurses' health and well-being. This predictive study aims to describe the level of Work-SoC and determine the predictability of Work-SoC can be explained by age, income, education, social support, resilience, and work engagement. The sample included 270 nurses, randomly selected from two affiliated hospitals of Kunming Medical University in China. The research instruments included the demographic data form, the Work-related Sense of Coherence Scale (Work-SoC Scale), the Personal Resources Questionnaire (PRQ2000), the Connor-Davidson Resilience Scale (CD-RIS), and the 9-item Utrecht Work Engagement Scale (UWES-9). Cronbach's alpha coefficients for the Work-SoC Scale, PRQ2000, CD-RIS and UWES-9 were .87, .93, .98, and .94, respectively. Descriptive statistics and multinomial logistic regression were used to analyze the data.

The results of this study were:

1. The overall score of Work-SoC was at a moderate level.
2. Social support and income were significant predictors of Work-SoC for nurses who perceived moderate levels of Work-SoC when compared to nurses who perceived low levels of Work-SoC (OR = 1.72, 95% CI = 1.15 to 2.58,  $p < .01$  and OR = .19, 95% CI = .05 to .71,  $p < .05$ ). In addition, social support and work engagement were significant predictors of Work-SoC for nurses who perceived high levels of Work-SoC when compared to nurses who perceived low levels of Work-SoC (OR = 4.02, 95% CI = 1.86 to 8.70,  $p < .01$  and OR = 2.01, 95% CI = 1.24 to 3.23,  $p < .01$ ).

The results of this study provide basic information for hospitals and nurse administrators to develop strategies or interventions to improve social support and work engagement which will enhance Work-SoC among Chinese nurses in affiliated hospitals of Kunming Medical University.

**Keywords:** Work-related sense of coherence; Predicting factors; Nurses

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## บทคัดย่อ

ความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงาน (Work-SoC) เป็นปัจจัยสำคัญสำหรับการส่งเสริมให้พยาบาลมีสุขภาพและชีวิตความเป็นอยู่ที่ดี การศึกษาเชิงทำนายนี้มีวัตถุประสงค์เพื่อพรรณนาระดับของความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานและประเมินความสามารถในการทำนายความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงาน จำแนกตามอายุ รายได้ ระดับการศึกษา การสนับสนุนทางสังคม ความยืดหยุ่น และความยึดมั่นผูกพันในงาน กลุ่มตัวอย่างประกอบด้วยพยาบาลจำนวน 270 คน ที่สุ่มจากโรงพยาบาลเครือข่ายวิทยาลัยการแพทย์คุณหมิง ประเทศสาธารณรัฐประชาชนจีนจำนวนสองแห่ง เครื่องมือในการวิจัยประกอบด้วย แบบบันทึกข้อมูลทั่วไป แบบวัดความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงาน (Work-SoC Scale) แบบสอบถามเกี่ยวกับทรัพยากรส่วนบุคคล (PRQ2000) แบบวัดความยืดหยุ่นของคอนเนอร์-เดวิดสัน (CD-RIS) และแบบวัดความยึดมั่นผูกพันในงานของยูทริก 9 ข้อ (UWES-9) ค่า Cronbach's alpha coefficients ของ Work-SoC Scale, PRQ2000, CD-RIS and UWES-9 เท่ากับ .87, .93, .98, และ .94 ตามลำดับ วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา และสถิติ multinomial logistic regression

ผลของการศึกษาครั้งนี้พบว่า

1. คะแนนโดยรวมของความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานตามการรับรู้ของพยาบาลอยู่ในระดับปานกลาง
2. การสนับสนุนทางสังคมและรายได้ เป็นปัจจัยทำนายความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานของพยาบาลที่รับรู้ความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานในระดับปานกลาง เมื่อเทียบกับพยาบาลที่รับรู้ความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานในระดับต่ำ ( $OR = 1.72$ , 95%  $CI = 1.15$  to  $2.58$ ,  $p < .01$  and  $OR = .19$ , 95%  $CI = .05$  to  $.71$ ,  $p < .05$ ) นอกจากนี้การสนับสนุนทางสังคมและความยึดมั่นผูกพันในงานเป็นปัจจัยทำนายความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานของพยาบาลที่รับรู้ความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานในระดับสูง เมื่อเทียบกับพยาบาลที่รับรู้ความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานในระดับต่ำ ( $OR = 4.02$ , 95%  $CI = 1.86$  to  $8.70$ ,  $p < .01$  and  $OR = 2.01$ , 95%  $CI = 1.24$  to  $3.23$ ,  $p < .01$ )

ผลการศึกษาให้ข้อมูลพื้นฐานสำหรับผู้บริหารโรงพยาบาล และผู้บริหารทางการพยาบาล ในการพัฒนากลยุทธ์หรือวิธีการในการพัฒนาการสนับสนุนทางสังคม และความยึดมั่นผูกพันในงาน ซึ่งจะเสริมสร้างความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงานของพยาบาลจีนในโรงพยาบาลเครือข่ายวิทยาลัยการแพทย์คุณหมิง

**คำสำคัญ:** ความเข้มแข็งในการมองโลกที่เกี่ยวกับการทำงาน ปัจจัยทำนาย พยาบาล

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## Background and Significance

Nurses' experience of stress at work during the nursing shortage has undesirable effects on their health and safety and affects the whole organization's health and effectiveness (Holman, Johnson, & O'Connor, 2018). The sense of coherence (SOC) was defined by Antonovsky (1987) as a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence. It indicates an individual's internal psychological tendency to an extent and shows the individual's comprehensive understanding of environmental stress, managing abilities of resource mobilization, and sense of the meaning of stressors and life. Thus, SOC is considered an adaptive personal disposition that enables coping with adverse experiences (Eriksson & Lindstrom, 2006). Considering work occupies a large part of one's life, SOC has an important and noticeable impact on an individual's working life.

Vogt, Jenny, and Bauer conceptualized work-related sense of coherence (Work-SoC), which is based on the SOC concept of Antonovsky (1987) and connects work and an organization's environment to individual health. Work-SoC was defined as the perceived comprehensibility, manageability, and meaningfulness of an individual's current work situation (Vogt, Jenny, & Bauer, 2013), and it consists of three components: comprehensibility, manageability, and meaningfulness. Since then, the term "Work-SoC" has been used interchangeably with SOC. Work-related sense of coherence (Work-SoC) was proposed as an indicator of the health-promoting quality of life at work (Vogt, Jenny, Füllemann, Inauen, & Bauer, 2012). A high level of Work-SoC also contributes to increased job performance, work engagement, and enthusiasm at work and reduces absenteeism, turnover intention, work withdrawal, fatigue, sleep problems, exhaustion, and work-related stress (Bauer, Vogt, Inauen, & Jenny, 2015; Van der Westhuizen, 2018).

Several researchers have discovered low to moderate levels of SOC among nursing professionals in different countries as well as China, but very few studies were conducted in foreign countries referring to nurses' Work-SoC. A study of Work-SoC among nurses has not been found in China. Furthermore, based on the literature review, Work-SoC is influenced by the interaction between personal factors including age, income, and education, and the working environment factors including social support, resilience, and work engagement. Moreover, all these six factors were found positively correlated with Work-SoC. However, the results showed inconsistent findings between age, education and Work-SoC among nurses worldwide, and no study was conducted referring to income, social support, resilience, work engagement and Work-SoC among nurses in China.

Due to the rapidly growing economy and the changing healthcare environment, nurses working in China are believed to have a high level of job pressure (Ren, Zhou, Wang, Luo, Huang, & Zeng, 2018). Both male and female nurses working in China had a lower general well-being level than the general Chinese population (Yu, Song, Dong, Su, & Zhang, 2020). Although China has the largest population globally, the ratio of registered nurses per thousand people is only 2.73, which is far below 8.76 in the United States (2014), 11.46 in Japan (2015), and 13.51 in



Germany (2015) (Zhou, Zhao, Kong, Campy, & Qu, 2018). Despite this, some nurses and hospital administrators view nurses as replaceable labor, so they receive lower social support and less respect than physicians (Zhu, Rodgers, & Melia, 2015). Therefore, it is vital to establish a healthy work environment for nurses under the current work environment and promote them to work in a “salutogenic” way.

Based on the limited amount of research exploring Work-SOC among nurses and the inconsistent findings on the relationship between Work-SOC and related factors, it is necessary to conduct a study to confirm the level of Work-SoC among nurses in China and to examine the predictability of Work-SoC that can be explained by factors including age, income, education, social support, resilience, and work engagement among nurses in Affiliated Hospitals of KMU, Yunnan Province.

### Research Objectives

This study aimed to explore Work-SoC and the predictability of Work-SoC that can be explained by factors including age, income, education, social support, resilience, and work engagement as perceived by nurses in Affiliated Hospitals of KMU, the People’s Republic of China.

### Conceptual Framework

The conceptual framework of Work-SoC in this study is based on Antonovsky’s salutogenic model (Antonovsky, 1987). Work-related sense of coherence refers to the perceived comprehensibility, manageability, and meaningfulness of a nurse’s current work situation (Vogt et al., 2013). Based on the literature review, the factors predicting Work-SoC in this study consist of individual characteristics including age, income, education, and working environment factors including social support, resilience, and work engagement. The predictability of Work-SoC among selected variables, including age, income, education, social support, resilience, and work engagement was tested in this study.

### Methodology

#### Population and Sample

The target population was 3,709 staff nurses who worked in the two Affiliated Hospitals of KMU. The sample size was calculated by the rule of thumb by Polit and Beck (2017), with 20% added for possible loss, resulting in 288 total participants. The participants in each hospital and department were determined by the proportion of nurses in that hospital or department. A simple random sampling method was used to select the samples from a list of staff nurses in each department. Registered nurses who had worked for at least one year in their current department were included. Nurse administrators and staff nurses who were on vacation, study leave, maternity leave, or marriage leave were excluded.

#### Research Instruments

There were five research instruments used in this study:

1. The demographic data form was developed by the researcher.



2. The Work-related Sense of Coherence Scale (Work-SoC Scale) was developed by Vogt et al. (2013). The Work-SoC Scale was translated into Chinese by the researcher without any modification and back-translated into English by a Chinese bilingual expert. The original English and back-translated versions were checked for equal meaning by the original author and a native English-speaking person (Brislin, 1980). It consists of 9 items and each item is scored by a 7-point Likert scale. The higher mean score of the total scale indicates better Work-SoC.

3. The Personal Resources Questionnaire (PRQ2000) was developed by Weinert (2000) to measure perceived social support, and translated into Chinese by Chiou, Tsai, and Chung (2004). The PRQ2000 comprises 15 items rated by a 7-point Likert scale with higher scores indicating a higher level of perceived social support.

4. The Connor-Davidson Resilience Scale (CD-RISC) was developed by Connor and Davidson (2003) to measure nurses' ability to cope with stress. Yu and Zhang (2007) translated the CD-RISC into Chinese. The full scale has 25 items scored by a 7-point Likert scale. A higher score reflects higher resilience.

5. The 9-item Utrecht Work Engagement Scale (UWES-9) was designed by Schaufeli, Bakker, and Salanova (2006) to measure nurses' work engagement, and it was translated into Chinese by Li, Zhao, and Zhang (2013). It has 9 items rated by a 7-point Likert scale. The higher mean score on the total scale indicates a higher level of work engagement.

The construct validity of the Work-SoC Scale and UWES-9, the divergent validity of PRQ2000, and the convergent and discriminant validity of CD-RISC was confirmed by the original authors. Therefore, the researcher used these instruments, after getting permission, without any modification. The internal consistency of all instruments for Work-SoC Scale, PRQ2000, CD-RISC, and UWES-9 were .87, .93, .98, and .94, respectively.

### **Ethical Considerations**

Ethical approval of this study was provided by the Research Ethics Review Committee of the Faculty of Nursing, Chiang Mai University, Thailand. Data collection permission was obtained from the two Affiliated Hospitals of KMU in China. All participants have been informed of the aims and process of data collection, and voluntary participation and were asked to sign an informed consent form. The researcher guaranteed all participants about the confidentiality and anonymity of their responses, and any information provided by participants will be presented as a group and be used for this study only.

### **Data Collection**

After getting data collection permission from nursing directors in two Affiliated Hospitals of KMU, a research coordinator from each hospital was determined by the nursing directors to distribute and collect research questionnaires from the subjects. A random sampling method was applied to determine the subjects from the name list of nurses working in different departments of both hospitals. A total of 288 questionnaires were distributed and 270 (93.75%) completed questionnaires were analyzed.



## Data Analysis

Demographic data were analyzed using frequency, percentage, mean, and standard deviation. The scores of the Work-SoC, social support, resilience, and work engagement were analyzed using mean and standard deviation. Factors predicting Work-SoC were tested using multinomial logistic regression analysis after testing the assumptions for the logistic regression. The underlying assumption for the logistic regression, particularly the multicollinearity of variables, was tested using Variance Inflation Factors (VIF). In this study, the VIF ranged from 1.088 to 1.909, which means no multicollinearity problem.

## Results

1. The mean age of the subjects was 33.29 years old (SD = 6.42). The majority of the subjects were female (97.04%), married (74.82%), and had bachelor's degrees (92.96%). With regards to employment status, the majority of subjects were temporary (73.70%), doing three-shift work (63.33%), and with monthly income ranging from RMB 6001 to RMB 8000 (48.52%).

2. The overall Work-SoC as perceived by subjects was at a moderate level ( $\bar{X}$  = 4.81, SD = 0.94). With regards to the three dimensions of the Work-SoC, comprehensibility ( $\bar{X}$  = 4.64, SD = 1.29) and manageability ( $\bar{X}$  = 4.75, SD = 1.08) were at moderate levels and meaningfulness ( $\bar{X}$  = 5.03, SD = 1.47) was at a high level (Table 1).

**Table 1** Mean, Standard Deviation, and Range of Overall and the Three Dimensions of Work-SoC as Perceived by Subjects (n = 270)

	Mean	SD	Range	Level
Overall Work-SoC	4.81	0.94	1.89 – 7.00	Moderate (3.01 – 5.00)
Comprehensibility	4.64	1.29	1.75 – 7.00	Moderate (3.01 – 5.00)
Manageability	4.75	1.08	1.00 – 7.00	Moderate (3.01 – 5.00)
Meaningfulness	5.03	1.47	1.00 – 7.00	High (5.01 – 7.00)

3. When compared to low level for Work-SoC nurses, social support and income were the predictors of Work-SoC for the nurses who perceived a moderate level of Work-SoC (OR = 1.72, 95% CI = 1.15 to 2.58,  $p < .01$  and OR = .19, 95% CI = .05 to .71,  $p < .05$ ); social support and work engagement were the predictors of Work-SoC for the nurses who perceived a high level of Work-SoC (OR = 4.02, 95% CI = 1.86 to 8.70,  $p < .01$  and OR = 2.01, 95% CI = 1.24 to 3.23,  $p < .01$ ) (Table 2).



**Table 2** Multinomial Logistic Regression Analysis of the Factors Predicting Work-SoC as Perceived by the Subjects (n = 270)

Work-SoC	Variables	B	SE	OR	95% CI		p
					LL	UL	
Moderate	Intercept	-.97	1.86				.60
	Social support	.54	.21	1.72	1.15	2.58	.01**
	Income						
	Income 2001-4000	-1.65	.67	.19	.05	.71	.01*
High	Income >8,000	0					
	Intercept	-10.42	3.10				.00
	Social support	1.39	.39	4.02	1.86	8.70	.00**
	Work engagement	.70	.24	2.01	1.24	3.23	.00**

*Note.* Non-significant variables (age, education, and resilience) are not reported. B = logistic coefficient; SE = standard error; OR = odds ratio; CI = confidence interval; LL = lower limit; UL = upper limit; Cox and Snell  $R^2 = .253$ ; Nagelkerke  $R^2 = .302$ ; McFadden  $R^2 = .160$ .

## Discussion

### 1. The level of Work-SoC among nurses

The overall Work-SoC as perceived by nurses was at a moderate level. The results of the present study were consistent with the findings of a study conducted by Grødal, Innstrand, Haugan, and André (2019b) on nurses and other health and social service workers, which reported moderate levels of Work-SoC. The results of this study indicate that the majority of nurses working in Affiliated Hospitals of KMU who perceived a high level of Work-SoC (36.30%) could cope with some job difficulties in comparison to a small number of nurses that might not be able to manage work-related stressors (1.85%). This could be explained by the fact that the Affiliated Hospitals of KMU are Class A hospitals in Yunnan province, plenty of new graduate nurses are eager to work with these hospitals, and nurses who already work there are proud to work there. Thus, almost half of the nurses (49.26%) who perceived meaningfulness view work stressors as challenges and are willing to invest their commitment and engagement given Antonovsky (1987) indicated workers who perceived meaningfulness are more likely to positively comprehend stressors under a current workplace and energetically move their resources to manage these difficulties, finally increasing their whole Work-SoC. However, a small number of nurses perceived low Work-SoC which might be because of their low monthly income.

Nurses working in Affiliated Hospitals of KMU have standards clear and guidelines for their practices. The nurse managers also communicate and provide consultation to nursing staff (Nursing Department, 2020). The work context might cultivate nurses' comprehensibility, as Antonovsky (1987) elaborated, in that familiarity with role and position in a work context with



clear goals and plans provides employees with a comprehensive picture of their work environment. Another reason might be adequate resources are available for most nurses and that these resources are adequate for helping them cope with work demands. The development of nursing information systems, such as personal digital assistants (PDA) in Affiliated Hospitals of KMU, might help promote nurses' manageability due to its outstanding contribution to improving information access, simplifying workflow, and reducing nursing error (Shen, Zang, & Cong, 2018). Moreover, a good learning environment and various training programs update nurses' work skills, enrich their knowledge and prepare them for better clinical competence and capacities, which might promote nurses' sense of manageability. Nevertheless, 35.19% of nurses in this study perceived that their current work stressors were to some extent unpredictable, and 40.37% of nurses perceived a high level of work and that their work situation was somewhat and sometimes uncontrollable, which might weaken nurses' whole Work-SoC in this study.

## 2. Factors predicting Work-SoC

The present study found that three factors significantly predicted Work-SoC: social support (OR = 4.02, 95% CI = 1.86 to 8.70,  $p < .01$ ; OR = 1.72, 95% CI = 1.15 to 2.58,  $p < .01$ ), work engagement (OR = 2.01, 95% CI = 1.24 to 3.23,  $p < .01$ ), and income (OR = .19, 95% CI = .05 to .71,  $p < .05$ ). However, age, education, and resilience were not significant predictors.

This study revealed that social support was a predictor of nurses' perception of moderate and high Work-SoC. This finding was consistent with the study conducted by Grødal, Innstrand, Haugan, and André (2019a) on nurses and other health professionals, which indicated that social support was positively correlated with Work-SoC. The results could be explained that social support was viewed as an important generalized resistance resource that could be applied to a wide range of demands and stressors for fostering SOC (Eriksson & Mittelmark, 2017). One reason might be the current Nurse Act in China was carried out in 2008 and stated their relevant rights, which allowed unified nurses, especially the temporarily employed nurses (73.70%), to enjoy equal salaries and equal opportunities for education and promotion. Therefore, their psychological demands were satisfied, and they had a stronger sense of belonging to the hospital than before (Liu et al., 2018). Another reason might be due to the rewards and the recognition that Chinese nurses have received from hospitals and the population since the COVID-19 pandemic.

Concerning work engagement, it was a significant predictor of nurses' perception of a high level of Work-SoC. The findings of this study were in line with a study by Malagon-Aguilera et al. (2019) which revealed a significant linkage between SOC and work engagement among Spanish nurses. This could be explained by the fact that Chinese nurses are acknowledged to be the backbone of healthcare services and are engaged in all activities from admission to discharge, so they are required to put adequate vigor and a high level of dedication into their work,



especially during the special period of COVID-19. Nurses with high vigor and dedication could constructively comprehend difficulties and stress, considering them to be explicable and predictable, are proud of their work, and view work as meaningful. Thus, they are willing to invest more energy and can effectively manage their work demands, which cultivates their confidence to confront challenges (Grødal et al., 2019b), leading to the fostering of Work-SoC. Also, Chinese nurses experience severe workloads and are required to undertake their work with absorption to improve work efficiency and provide high-quality care (Hui, Wenqin, & Yan, 2013). Nurses with high absorption experience the meaningfulness and worth of their work, and tend to positively reach the goals of their work, thereby promoting their Work-SoC.

The results also found that income was positively related to Work-SoC, and it was a significant predictor of nurses' moderate level of Work-SoC. The results of this study were consistent with a previous study by Peng (2021) on 392 oncology nurses in China, which found a positive correlation between income and SOC. The possible explanation could be that a good income status enables nurses to view the current job and work conditions as comprehensive, manageable, and meaningful. With rapid economic growth and social development in China, Chinese nurses, who are predominantly female, have to earn money to support their families. Therefore, they are more likely to view their current job as indispensable and important, to be involved in their work, and to be motivated to do better work. In addition, nurses who earned a higher monthly income were more likely to feel that they had better competency, which consequently increased their accomplishment and the meaningfulness of their job (Zhang et al., 2020). As a result, a higher level of income cultivated nurses' Work-SoC.

### Conclusion and Implications

Nursing administrators should pay attention to building a healthy and supportive work environment, a clear career ladder for nurses, reasonable reward distribution, adequate training opportunities, and a flexible work schedule to improve nurses' overall Work-SoC. The results of this study suggest that nursing administrators are noteworthy for providing opportunities for nurses to participate in decision-making to increase their sense of belonging and professional value. In addition, the strategies for promoting social support from nurse administrators and colleagues, improving work engagement through increasing work meaningfulness and work value, and appropriate income allocation should be considered.

### Recommendations

Examine the factors predicting the Work-SoC in different hospital levels, for other types of health care personnel, as well as other types of nurses, such as contract nurses and nursing administrators. Furthermore, a causal model of Work-SoC should be developed based on predicting factors of Work-SoC.



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