



Factors related to Sense of Coherence in Japanese university athletes: Cross-sectional studies based on demographic factors

 Yutaka Sonobe  . Faculty of Humanities and Social Sciences. Teikyo Heisei University. Japan.


ABSTRACT

The main aim of the current study was to examine cross-sectionally the correlation between demographic factors and Sense of Coherence (SOC) in Japanese university athletes. The study's participants were 1,154 Japanese university athletes (771 males and 383 females, mean age 20.02 ± 1.13 years) that have enrolled in Japanese physical education universities. The survey items comprised sex, age, athletic events, years of an athletic career, regular position (regular or non-regular), competition level, and SOC. Binomial logistic regression analysis was then conducted to evaluate the correlation among demographic factors and SOC in universities athletes. The results of the study demonstrated that regular members of Japanese physical education universities were associated with higher SOC. Based on the above, the various life experiences that athletes experience when becoming a regular member could be associated with the establishment and development of SOC. The results of this study can lead to specific interventions toward the enhancement of SOC, not only in becoming regular members but also in SOC development and formation. Moreover, the presented results provide important information for psychological support and guidance to university athletes from a salutogenic perspective.

Keywords: Sport psychology, Demographic factors, Life experiences, University, Logistic regression.

Cite this article as:

Sonobe, Y. (2022). Factors related to Sense of Coherence in Japanese university athletes: Cross-sectional studies based on demographic factors. *Scientific Journal of Sport and Performance*, 2(1), 52-58. <https://doi.org/10.55860/RQBU8329>

 **Corresponding author.** Faculty of Humanities and Social Sciences, Teikyo Heisei University, 164-8530, 4-21-2, Nakano, Nakano-ku, Tokyo, Japan.

E-mail: y.sonobe@thu.ac.jp

Submitted for publication October 18, 2022.

Accepted for publication November 29, 2022.

Published December 23, 2022.

[Scientific Journal of Sport and Performance](#). ISSN 2794-0586.

©Asociación Española de Análisis del Rendimiento Deportivo. Alicante. Spain.

doi: <https://doi.org/10.55860/RQBU8329>

INTRODUCTION

During the 2020 Tokyo Olympics, several elite athletes complained repetitively regarding their mental health condition. The importance of mental health management is continuously increasing (Walker et al., 2022) and research indicates that depression and anxiety incidence in elite athletes is approximately 34%, higher when compared to the general population (Gouttebarga et al., 2019). University athletes have also reported mental health problems in depression and social anxiety (Storch et al., 2005). Research on Japanese university athletes implies that stressors in competitions and daily life can lead to mental health issues and burnout (Kimura et al., 2013). In addition, athletes that enrolled at a university via sports recruitment programs face difficulties in balancing sports life and academics that can lead to mental health issues (Arai et al., 2021). University athletes are required to cope with various stresses and preserve decent mental health.

In principle, stress research has focused predominantly on stress as a negative factor. Nevertheless, stress has also been considered a positive factor for personal growth. Sense of Coherence (SOC) is the theory suggesting that stress can be a positive force leading to improved health (Antonovsky, 1987). SOC is one of the core concepts of salutogenesis, it acts as a buffer for stressors and contributes in the maintenance of mental health (Höge & Büssing, 2004; Richardson & Ratner, 2005). A previous study evaluating the effects of SOC in university athletes discovered that athletes with a stronger SOC are under significantly lower stress and negative psychological symptoms (Skirka, 2000). The study indicated that competitive stress is perceived positively and stimulates good mental health.

Based on the above, SOC has contributed in the maintenance and improvement of university athletes' mental health. Nevertheless, not adequate research has been performed regarding specific factors inducing higher and lower SOC in university athletes. If solid factors are identified, they could contribute to specific interventions enhancing SOC during its development and formation.

The purpose of the current study was to cross-sectionally investigate the association among demographic factors and SOC in Japanese university athletes.

MATERIAL AND METHODS

Participants

The study included 1,154 university student-athletes (771 males and 383 females, mean age 20.02 ± 1.13 years) as participants that were enrolled in physical education in Japan, after completing a survey form.

Measures

Survey participants were questioned about sex, age, athletic events, years of an athletic career, regular position (regular or non-regular), and competition level (Regional tournament, National convention, or World championship).

The years of an athletic career were separated into four groups based on previous studies (Endo et al., 2012; Tokunaga et al., 1994).

SOC was measured based on the Japanese version of the SOC-13 scale (Antonovsky, 1987). SOC-13 consists of three factors: comprehensibility, manageability, and meaningfulness, while the total score of all 13 items was used as the SOC score. The higher score indicates the higher SOC rated. In addition, in a previous study, the reliability and validity of the Japanese version of the SOC-13 have also been verified

(Togari et al., 2008). The Cronbach's alpha coefficient in that study was 0.73, suggesting a commonly high internal consistency.

SOC was divided into low and high groups based on the median of 54 points obtained in this study.

Procedure

The survey was performed from June to September 2014 after acquiring the prior consent of the teacher in charge of the lecture, physical instructors, and club coaches. The subjects received explanations for the study's purpose before the survey.

This study was performed after approval from the Nippon Sport Science University research ethics review, with which the author was formerly affiliated.

Analysis

The qualitative data items were presented as the number of people (%), while quantitative data items were presented by the mean (\pm standard deviation). In order to assess the characteristics of the subjects, χ -square and t-tests were conducted. Binomial logistic regression analysis was then employed to evaluate the association among demographic factors and SOC in university athletes. SOC was employed as a dependent variable (low or high SOC) while the age group (18, 19, 20, 21, 22 years old), the years of an athletic career (0 – 2, 3 – 4, 5 – 9 and > 10 years), the regular position, and the competition level (Regional tournament, National convention or World championship) were selected as independent variants. The sex (male or female), the age, and the athletic events were applied as covariates. All data were analyzed using EZR (Kanda, 2013), and statistical significance was considered when less than 5%.

RESULTS

Athletic events of the participants (Table 1).

Table 1. Type of sport of the participant.

	<i>n</i>	%		<i>n</i>	%		<i>n</i>	%
Total	1154	100						
Track & Field	220	19.06	Kendo	15	1.30	Baton Twirling	3	0.26
Baseball	147	12.74	Soft Tennis	12	1.04	Fencing	3	0.26
Soccer	143	12.39	Badminton	11	0.95	Naginata	3	0.26
Basketball	77	6.67	Life Saving	10	0.87	Boxing	2	0.17
Handball	69	5.98	Lacrosse	9	0.78	Cheerleading	2	0.17
Softball	61	5.29	Ski	9	0.78	Inline Hockey	2	0.17
Rugby	52	4.51	Swimming	9	0.78	Rhythmic Gymnastics	2	0.17
Volleyball	43	3.73	Ultimate	9	0.78	Triathlon	2	0.17
Gymnastics	38	3.29	Dance	6	0.52	Ballet	1	0.09
American Football	34	2.95	Double Dutch	6	0.52	Figure Skate	1	0.09
Tennis	33	2.86	Futsal	6	0.52	Kyudo	1	0.09
Judo	30	2.60	Boat	5	0.43	Shorinjikenpo	1	0.09
Field Hockey	23	1.99	Canoe	5	0.43	Squash	1	0.09
Table Tennis	19	1.65	Ice Hockey	5	0.43	Taichi	1	0.09
Touch Rugby	17	1.47	Karate	5	0.43	Trampoline	1	0.09

The number of athletic events was 45. Track and field was the most common event.

Sociodemographic characteristics of the participants (Table 2).

Analysis revealed significant number of biases in the regular position ($\chi^2(1) = 18.93, p < .001$) and the competition level ($\chi^2(2) = 15.99, p < .001$).

Table 2. Sociodemographic characteristics of participants.

Factor	Group	Overall	Male	Female	p-value
<i>n</i>		1154	771	383	
Age group (%)	18 years old	120 (10.4)	78 (10.1)	42 (11.0)	.82
	19 years old	239 (20.7)	167 (21.7)	72 (18.8)	
	20 years old	412 (35.7)	271 (35.1)	141 (36.8)	
	21 years old	262 (22.7)	173 (22.4)	89 (23.2)	
	22 years old	121 (10.5)	82 (10.6)	39 (10.2)	
	Mean (\pm SD)	20.02 (1.13)	20.02 (1.13)	20.03 (1.13)	
Years of an athletic career (%)	0–2 years	62 (5.37)	47 (6.10)	15 (3.92)	.11
	3–4 years	116 (10.05)	73 (9.47)	43 (11.23)	
	5–9 years	448 (38.82)	286 (37.09)	162 (42.30)	
	> 10 years	528 (45.75)	365 (47.34)	163 (42.56)	
	Mean (\pm SD)	8.85 (3.97)	8.93 (4.06)	8.71 (3.79)	
Regular position (%)	Non regular	642 (55.63)	464 (60.18)	178 (46.48)	<.001 ^a
	Regular	512 (44.37)	307 (39.82)	205 (53.52)	
Competition level (%)	Regional tournament	507 (43.93)	370 (47.99)	137 (35.77)	<.001 ^a
	National convention	610 (52.86)	380 (49.29)	230 (60.05)	
	World championship	37 (3.21)	21 (2.72)	16 (4.18)	
SOC (%)	Low	549 (47.57)	355 (46.04)	194 (50.65)	.15
	High	605 (52.43)	416 (53.96)	189 (49.35)	

Note. Group compared by using the t-test or χ^2 test^a.

Table 3. Binomial logistic regression analysis of sociodemographic factors related to SOC.

		OR	95% CI	p-value
Age group	18 years old	1.00		
	19 years old	0.99	0.62 - 1.56	.95
	20 years old	1.07	0.70 - 1.64	.76
	21 years old	1.09	0.70 - 1.72	.70
	22 years old	1.64	0.96 - 2.79	.07
Years of an athletic career	0–2 years	1.00		
	3–4 years	1.20	0.57 - 2.56	.63
	5–9 years	1.00	0.47 - 2.13	.99
	> 10 years	0.92	0.42 - 1.99	.83
Regular position	Non regular	1.00		
	Regular	1.54	1.18 - 2.00	.00
Competition level	Regional tournament	1.00		
	National convention	0.82	0.63 - 1.07	.15
	World championship	1.34	0.60 - 3.00	.48

Note. OR: Odds Ratio, CI: Confidence Interval. Moderator variables were sex and type of sport.

SOC and binomial logistic regression analysis of sociodemographic factors (Table 3).

Binomial logistic regression analysis revealed that regular athletes (OR = 1.54, 95% CI = 1.18 – 2.00) were correlated with higher SOC than non-regular athletes.

DISCUSSION

In the present study, the correlation between demographic factors and SOC in Japanese university athletes was cross-sectionally assessed.

The binomial logistic regression analysis demonstrated that regular members were associated with higher SOC and the various experiences that athletes experience when becoming regulars could be associated with the formation and development of SOC.

Life experiences related to the establishment and development of SOC involve three factors: 1) Consistency, which is the experience of living within stable rules and norms, 2) Load balance, which is the experience of coping well under moderate stress and 3) Participating in shaping of outcomes which is the experience of participation in decision-making (Antonovsky, 1979; Sagy & Antonovsky, 2000).

In Consistency, many competitive sports contain rules and discipline in team activities. The rules and regulations affect consistent experiences and can contribute to stability in their competitive activities by providing a clear direction for their efforts. In addition, Consistency is an essential factor for the establishment of a continuous competitive experience and for being regular members.

In Load balancing, players experience higher stress in becoming regulars. When considering sports injuries for instance, a survey in athletic trainers demonstrated that all injured athletes suffer from psychological trauma (Larson et al., 1996). Furthermore, since athletes' injury layoffs have been correlated with lower SOC scores (Mayer & Thiel, 2014), high stress levels may interfere with SOC establishment. Although injury experiences can be significantly stressful, stress can become a balanced and the experience can be overcome with appropriate support from staff and professionals. Athletes are thus, expected to continue competing for earning a regular spot.

In Participating in shaping of outcomes, decision-making is significantly associated with the invention of training methods, performance enhancements and determination of team policy. In these cases, participation in team discussions initiatives can be critical while these experiences depend on the management by team coaches. A study has demonstrated that when team coaches unilaterally remove athletes' decision-making, distrust of the coach is generated, it interferes with athletes' identity and mental health and it leads to early withdrawal from competitions (Uematsu et al., 2021).

Based on the above, SOC is expected to be developed by a complex intertwining of three types of experiences: competitive experiences under stable rules and norms, successful coping experiences under moderate stress, and involvement in critical decision-making.

CONCLUSIONS

The outcomes of the present study contribute to the establishment of particular interventions to support the establishment and development of SOC and to eventually develop regular members. The presented results

also provide an important resource for psychological support and guidance of universities athletes from a salutogenic perspective.

Nevertheless, the present study presented some limitations. Initially, world championship level participants accounted for only 3.2%, a significantly lower percentage of participants compared to other groups of the competition level. To this end, additional surveys for world championship level subjects should be pursued in the future. Moreover, a causal relationship is unknown as the current study was cross-sectional, and future studies should be focused on longitudinal studies.

SUPPORTING AGENCIES

This study was supported by an academic research grant from the Nippon Sport Science University in 2014.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

REFERENCES

- Antonovsky, A. (1979). *Health, stress, and coping*/Aaron Antonovsky. Jossey-Bass Publishers.
- Antonovsky, A. (1987). *Kenko-no-nazo-wo-toku [Unraveling the mystery of health: how people manage stress and stay well]* Y. Yamazaki & K. Yoshii (Trans.). Yushindo Kobunsha. <https://doi.org/10.4135/9781446221129.n9>
- Arai, H., Sugimoto, T., Masuda, M., Kamano, S., & Tokuyasu, A. (2021). Sport-life balance and mental health in university student-athletes: A comparative study by admissions pathway. *Journal of Japan Society of Sports Industry*, 31(3), 3_341–3_349. https://doi.org/10.5997/sposun.31.3_341
- Endo, S., Kanou, H., & Oishi, K. (2012). Sports activities and sense of coherence (SOC) among college students. *International Journal of Sport and Health Science*, 10, 1–11. <https://doi.org/10.5432/ijshs.201114>
- Gouttebauge, V., Castaldelli-Maia, J. M., Gorczynski, P., Hainline, B., Hitchcock, M. E., Kerkhoffs, G. M., Rice, S. M., & Reardon, C. L. (2019) Occurrence of mental health symptoms and disorders in current and former elite athletes: A systematic review and meta-analysis. *British Journal of Sports Medicine*, 53(11), 700–706. <https://doi.org/10.1136/bjsports-2019-100671>
- Höge, T., & Büssing, A. (2004). The impact of sense of coherence and negative affectivity on the work stressor—Strain relationship. *Journal of Occupational Health Psychology*, 9(3), 195–205. <https://doi.org/10.1037/1076-8998.9.3.195>
- Kanda, Y. (2013). Investigation of the freely available easy-to-use software “EZ” for medical statistics. *Bone Marrow Transplantation*, 48(3), 452–458. <https://doi.org/10.1038/bmt.2012.244>
- Kimura, A., Tezuka, Y., & Sugiyama, Y. (2013). The relationship between stressors and burnout in college athletes. *Journal of Health Sciences*, 35, 25–31. <https://doi.org/info:doi/10.15017/27206>
- Larson, G. A., Starkey, C., & Zaichkowsky, L. D. (1996). Psychological aspects of athletic injuries as perceived by athletic trainers. *Sport Psychologist*, 10(1), 37–47. <https://doi.org/10.1123/tsp.10.1.37>
- Mayer, J., & Thiel, A. (2014). Health in elite sports from a salutogenic perspective: Athletes’ sense of coherence. *PLOS ONE*, 9(7), e102030. <https://doi.org/10.1371/journal.pone.0102030>
- Richardson, C. G., & Ratner, P. A. (2005). Sense of coherence as a moderator of the effects of stressful life events on health. *Journal of Epidemiology and Community Health*, 59(11), 979–984. <https://doi.org/10.1136/jech.2005.036756>

- Sagy, S., & Antonovsky, H. (2000). The development of the sense of coherence: A retrospective study of early life experiences in the family. *International Journal of Aging and Human Development*, 51(2), 155–166. <https://doi.org/10.2190/765l-k6nv-jk52-ufkt>
- Skirka, N. (2000). The relationship of hardiness, sense of coherence, sports participation, and gender to perceived stress and psychological symptoms among college students. *Journal of Sports Medicine and Physical Fitness*, 40(1), 63–70.
- Storch, E. A., Storch, J. B., Killiany, E. M., & Roberti, J. W. (2005). Self-reported psychopathology in athletes: A comparison of intercollegiate student-athletes and non-athletes. *Journal of Sport Behavior*, 28(1), 86–98.
- Togari, T., Yamazaki, Y., Nakayama, K., Kimura Yamaki, C., & Sasaki Takayama, T. (2008). Construct validity of Antonovsky's sense of coherence scale: Stability of factor structure and predictive validity with regard to the well-being of Japanese undergraduate students from two-year follow-up data. *Japanese Journal of Health and Human Ecology*, 74(2), 71–86. <https://doi.org/10.3861/jshhe.74.71>
- Tokunaga, M., Hashimoto, K., & Takayanagi, S. (1994). A study of "traits" and "state" of athletes' psychological performance levels: Regarding the players participating in the semirigid baseball tournament. *Journal of Health Sciences*, 16, 65–73. <https://doi.org/info:doi/10.15017/610>
- Uematsu, Y., Ito, M., Gushiken, T., & Suzukawa, K. (2021). Reasons for early withdrawal of Japanese top youth gymnasts. *Journal of Physical Exercise and Sports Science*, 26(2), 111–118.
- Walker, I., Brierley, E., Patel, T., Jaffer, R., Rajpara, M., Heslop, C., & Patel, R. (2022). Mental health among elite sportspeople: Lessons for medical education. *Medical Teacher*, 44(2), 214–216. <https://doi.org/10.1080/0142159X.2021.1994134>



This work is licensed under a [Attribution-NonCommercial-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-nc-sa/4.0/) (CC BY-NC-SA 4.0).