Original Article

Longitudinal study on the relationship between resilience and burnout among Japanese athletes

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Abstract
Psychological maladjustment, which results in burnout and dropout, has become a critical issue for athletes. In this context, an important factor in sport and health psychology is resilience or "the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances" (Masten, Best, & Garmezy, 1990). This longitudinal study investigated the relationship between resilience and burnout among Japanese athletes. The participants included 63 Japanese university athletes (male = 24, female = 39; mean age = 19.4, *SD* = 1.1), and they were studied three time periods. The analysis of covariance indicated the marginally significant relationship between the Group (Low Resilience Group/ High Resilience Group) and Period (Period 1/ Period 2/ Period 3). Furthermore, the results of the simple main effect tests showed that the High Resilience Group experienced a reduced burnout during Periods 1 and 3, but they temporarily increased their burnout score during Period 2 before it reduced the level of Periods 1 and 3. These findings support our hypothesis that resilience is negatively associated with burnout among athletes. In this longitudinal study, we clarified the relationship between resilience and burnout and determined that resilience leads to successful athletic adaptation.
Key Words*: resilience, burnout, longitudinal study, athletes

Introduction

Athletes are exposed to many psychologically stressful experiences in their daily lives and in their competitive sports activities (e.g., Brarnwell, Masuda, Wagner, & Holmes, 1975; Passer & Seese, 1983; Petrie, 1992). As a result, various psychological problems have been reported in athletes (e.g., Amemiya, Ueno, & Shimizu, 2013; Gustafsson, Kenttä, & Hassmén, 2011; Raedeke & Smith, 2001). The concept of "resilience" has been discussed in sport psychology and health psychology in the context of finding ways to provide support for athletes. Resilience has been defined as "the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances" (Masten, Best, & Garmezy, 1990). Resilience is an ability that can be learned and acquired by anyone (Grotberg, 2003). Ueno & Oshio (2015a) examined the dual-process models of resilience to prevent athletes from burning out and to facilitate their development. They suggested that (1) the process of resilience has negative effects on burnout via self-esteem and (2) the process of resilience has positive effects on the subjective development of athletes, as determined via the self-assessment of athletic performance. International research has also demonstrated that the resilience of athletes not only prevents burnout and the dropout rate but also contributes to maintaining and improving the mental health, development, and continuity of athletic life of the athletes (e.g., Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Holt & Dunn, 2004). Thus, athletic resilience that is developed through athletic performance is believed to improve the adaptation to stress and facilitates further athletic development.

However, sufficient evidence regarding the effect of resilience on athletes has not been presented by previous investigations, most of which have been cross-sectional studies. It is difficult to examine resilience only using cross-sectional methods because recovery from difficult conditions, the process of getting injured, the experience of maladaptation, and recovering from maladaptation all must be examined (e.g., Fergus & Ziemmerman, 2005; Garmezy, 1991; Luthar, Cicchetti, & Becker, 2000). Therefore, predictive longitudinal studies should also be conducted when investigating resilience (Oshio, 2011). Moreover, it is important to examine whether people with high resilience can recover from serious incidents, such as accidents (e.g., Meichenbaum, 2006; Nakaya, 2009; Oshio, Nakaya, Kaneko, Nagamine, 2002; Werner, 1989). Ishige & Muto (2005) suggested that it is important to investigate if people recover from negative psychological conditions after stressful experiences. In particular, the validity of the effect of resilience needs to be verified by demonstrating correlations between indicators that assess the recovery and achievement of positive results despite serious threats to adaptation and development (Oshio, 2012). Moreover, mental health should be assessed on a number of occasions to examine "recovery competency", which is a characteristic of resilience, by following changes in mental health (Haga & Ishizu, 2014).

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This study investigated the relationships between the resilience and burnout of athletes from a longitudinal perspective. Burnout is regarded as a state in which athletes lose motivation for competitive sports and are mentally and physically exhausted (Kishi, 1994; Raedack & Smith, 2001). It has been suggested that in addition to withdrawing from competitive sports, burnout can result in psychopathological problems, such as depression and neurosis (Iwasa & Kishi, 1991; Nakagomi & Kishi, 1991). Therefore, it is possible to examine the degree of psychological recovery from maladaptation by assessing the athletes' state of emotional and physical exhaustion using indices of burnout. This study was conducted in three time periods with approximately three-month intervals, based on previous studies (Finkel, 1995; Takahira, Ando, & Sakamoto, 2006). Amemiya & Sakairi (2015) reported that burnout increases during the competition season. Furthermore, Nakagomi & Kishi (1991) and Smith (1986) indicated that burnout appears and develops as a function of time. Based on these studies, we estimated that Periods 2 and 3 would be the period of high burnout. We hypothesized that burnout in the High Resilience Group during Period 1 would be low, whereas it would increase during Period 2 and decrease to the level of Period 1 during Period 3. The relationships between the athletes' resilience and recovery competencies were examined based on this hypothesis.

Materials and methods
Participants and Period of Study
This study was conducted in three time periods during 2014: mid-April to mid-May (Period 1), from mid-July to mid-August (Period 2), and from mid-October to mid-November (Period 3). The participants were Japanese university students (N = 63; male = 24, female = 39; mean age = 19.4, SD = 1.1) in athletic clubs of different universities in the Tokyo, Kanagawa, and Hyogo prefectures. Athletic events included individual and group events, such as softball, baseball, track and field events, badminton, and lacrosse, among others. The participants' highest athletic achievements after entering university varied, and they were involved in national, regional, and lower level competitions.

Procedures
This study, including its purpose, confidentiality, and ethical considerations were explained to the participants prior to the study. We explained to the participants that the survey would be conducted anonymously, that participation was voluntary, and that participants would not suffer any consequences if they did not participate in the study. The study was conducted after obtaining the approval of the ethics committee of the former institution where the first author is affiliated.

Questionnaire Sheet
(1) Basic attributes: The personal attributes (sex, age) and current club activities of the participants were asked using a general questionnaire.
(2) Resilience: Internal factors of the Psychological Resilience Scale for University Athletes (Ueno & Shimizu, 2012) were used for assessing the resilience of the athletes. These factors included the following four sub-scales, which included 16 items: "Athletic Motivation and Challenge" (e.g., I like being challenged by new plays.), "Athletic Mental Toughness" (e.g., I don't get depressed even if I lose a game.), "Athletic Self-understanding" (e.g., I understand my strong and weak points as an athlete.), and "Athletic Physical Toughness" (e.g., I can endure physical pain and fatigue.). The reliability and validity of these sub-scales were previously established. The participants responded using a five-point scale ranging from 1 (*No*) to 5 (*Yes*). Higher sub-scale scores indicated higher resilience. The total score of each sub-scale was calculated and used in the analysis, which was based on the work of Ueno, Suzuki, & Shimizu (2014) and Ueno & Oshio (2015a).
(3) Burnout: The burnout of the athletes was assessed using the Burnout Scale for University Athletes (Amemiya et al. 2013). This scale included the following four sub-scales, which included 20 items: "Interpersonal Exhaustion" (e.g., I sometimes find it difficult to cooperate with other club members.), "Lack of Personal Accomplishment" (e.g., I sometimes feel really joyful doing club activities.) (This item was reverse scored.), "Emotional Exhaustion for Athletic Practices" (e.g., I feel I cannot endure the training.), and "Devaluation toward Club Activities" (e.g., I sometimes feel participation in club activities is meaningless to me.). The participants responded using a five-point scale that ranged from 1 (*Very Untrue*) to 5 (*Very True*)." Higher sub-scale scores indicated higher burnout. The total score of each subscale was calculated and used in the analysis based on the work of Amemiya et al. (2013) and Ueno & Suzuki (2015).

Statistical Analysis
The effect of the level of resilience during Period 1 on the burnout during Periods 1 to 3 were examined using an analysis of covariance (ANCOVA) with Group (Low Resilience Group/ High Resilience Group) × Period (Period 1/ Period 2/ Period 3) as the independent variable and burnout as the dependent variable. The resilience scores during Periods 2 and 3 were the covariates. Based on the mean score of resilience during Period 1 ± 1 SD, participants with scores lower than the mean score −1 SD were classified as the Low Resilience Group, and those with scores higher than the mean score +1 SD were classified as the High Resilience Group. When there were significant or marginally significant relationships, simple main effect tests and multiple comparison tests were conducted using the Bonferroni method. Data were analyzed using IBM SPSS Statistics Ver. 22.0, which is statistical analysis software.

Results
Basic Statistics
Basic statistics (the mean score and standard deviation) of the variables of resilience and burnout for each Period (Periods 1 to 3) were calculated; see Table 1. Results of the one-way analysis of variance (ANOVA) indicated significant main effects of the resilience (F (2, 124) = 3.35, p = 0.038, η_p^2 = 0.05). The results of multiple comparisons using the Bonferroni method indicated that the scores of resilience during Period 3 were marginally significantly higher than during Period 1 (p = 0.092, Δ = 0.24), and those during Period 3 were marginally significantly higher than during Period 2 (p = 0.074, Δ = 0.21). Furthermore, participants were classified into High and Low Resilience Groups based on the mean score and the standard deviation of resilience, and they were used in further analyses.

Table 1 Fundamental Statistics

	Period 1		Period 2		Period 3		F-value	p-value	η_p^2
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*			
Resilience	59.75	7.71	59.94	7.90	61.59	8.06	3.35	0.038	0.05
Burnout	39.70	13.80	42.60	15.66	41.51	14.31	2.24	0.111	0.04

Relationship between Resilience and Burnout
The results of the ANCOVA indicated significant or marginally significant main effects for both Group (F (1, 27) = 3.10, p = 0.090, η_p^2 = 0.10) and Period (F (2, 54) = 4.35, p = 0.018, η_p^2 = 0.14). The relationship between the Group and Period was also marginally significant (F (2, 54) = 3.38, p = 0.080, η_p^2 = 0.09); see Table 2. A simple main effect test was conducted, which indicated the significant and marginally significant values during Period 1 (F (1, 27) = 6.47, p = 0.017, η_p^2 = 0.19), Period 3 (F (1, 27) = 3.85, p = 0.060, η_p^2 = 0.13), and for the High Resilience Group (F (2, 26) = 5.42, p = 0.011, η_p^2 = 0.29). Multiple comparison using the Bonferroni method indicated that the burnout scores in the High Resilience Group were significantly lower than in the Low Resilience Group during Period 1 (p = 0.017, d = 4.32). Additionally, during Period 3, the burnout scores in the High Resilience Group were significantly lower than in the Low Resilience Group (p = 0.060, d = 3.33). Furthermore, in the High Resilience Group, the burnout scores during Period 1 were significantly higher than those during Period 2 (p = 0.039, Δ = 2.55), and the burnout scores during Period 2 were significantly lower than those during Period 3 (p = 0.036, Δ = 2.05); see Fig. 1.
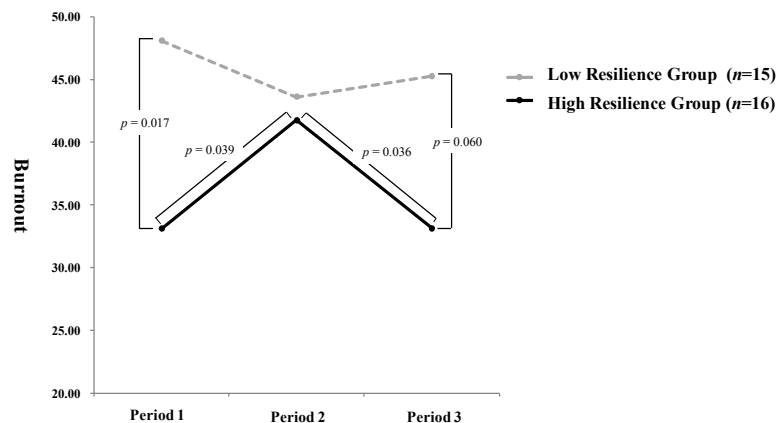
Table 2 Analysis of Covariance Results

	Period 1				Period 2				Period 3				Main Effect						Interaction		
	Low		High		Low		High		Low		High		Group			Period			Group×Period		
	Mean	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*Mean*	*SE*	*F*-value	*p*-value	η_p^2	*F*-value	*p*-value	η_p^2	*F*-value	*p*-value	η_p^2
Burnout	48.09	3.55	33.11	3.39	43.60	4.41	41.75	4.21	45.26	3.73	33.13	3.56	3.10	0.090	0.10	4.35	0.018	0.14	2.65	0.080	0.09

Note)

Low = Low Reilience Group (*n* = 15), High = High Reilience Group (*n* = 16)

The resilience scores during Periods 2 and 3 were the covariates.

Fig. 1 Analysis of Covariance Results

Discussion
The results indicated that burnout scores during Period 1 were low for athletes with a high resilience during that period. Even if the athletes experienced temporary increased burnout during Period 2, the burnout was reduced during Period 3 to a level identical to that during Period 1. These changes suggest a process of recovery from negative psychological health, which is indicative of the ability to recover one's mental health (e.g. Masten et al., 1990; Nakaya, 2009; Ueno & Oshio, 2015b; Werner, 1989).

Hirano (2012) suggested that even if people tend to get impaired by stressful conditions, they can avoid maladaptation by maintaining a high resilience, which provides a recovery competence. Moreover, Oshio, Kaneko, Nagamine, & Nakaya (2003) identified a High Resilience Group by using negative life events and General Health Questionnaire (GHQ) scores. They conducted a cluster analysis on scores of these two indices and identified three groups: an "Adapted Group", which had few negative life events and good mental health, a "Vulnerable Group", which had many negative life events and negative mental health, and a "Resilient Group" that had many negative life events and positive mental health. They compared competency scores for recovering mental health and found that the scores of adapted and Resilient Group were higher than those of the Vulnerable Group, suggesting that psychological recovery and adaptation could be facilitated by maintaining a high resilience (Fergus & Ziemmerman, 2005; Luthar et al., 2000). However, our present results indicate that the High Resilience Group experienced temporary increased burnout. This suggested that although resilience generally creates positive responses, it may induce negative responses depending on the period and the psychological condition of the athlete. Ueno & Suzuki (2015) suggested that although resilience inhibits burnout, it sometimes produces negative responses depending on the combination of resilience and burnout. Furthermore, resilience has dynamic characteristics, such as the ability to endure specific stressors, whereas it may produce pathological responses to other stressors or it may show maladaptive responses to stressors during a specific time period, even though the same stressor caused no negative effects during other time periods (Lepore & Revenson, 2006). Based on the results of this and previous studies, we believe that the resilience of athletes not only reduces negative responses during a specific time period but is also effective for facilitating mental recovery from psychologically unhealthy conditions that result from an accumulation of future negative responses.

Conclusion

The results of this study suggest a new perspective on the resilience competency of athletes to recovery their mental health. Applying the concept of resilience to sports may prevent burnout and the dropout rate of athletes, and it may maintain and improve their mental health. Currently and in the future, there is a need to develop intervention programs for improving athletes' resilience and to investigate their efficacy. Finally, athletes and coaches should be provided feedback regarding the results of these types of studies.

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