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Original Article

Development of an empowerment scale for pregnant women

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Abstract

Objective: The empowerment of pregnant women is defined as a sense of self-fulfillment and increased independence, gained through interaction with their environment and other individuals, leading to an increase in the spontaneous psychological energy to achieve the pregnancy and childbirth that they desire. The purpose of this study was to develop an empowerment scale for pregnant women for use in the evaluation of childbirth education and increasing the empowerment of pregnant women, and to examine the reliability and validity of that scale.

Method: A review of literature related to empowerment focusing on the field of tocology and maternal nursing science was conducted, and a scale of 42 items was created through a discussion of construct and content expression by three researchers in tocology in addition to pretests. We carried out a self-administered questionnaire survey on 173 pregnant women undergoing gynecologic checkup at obstetric facilities in the Hokuriku region. A total of 171 pregnant women who returned valid responses were selected as the subjects of the analysis.

Results: Through examination by Item-Total correlation and explanatory factor analysis, we employed 27 items adopted an analytics five factor. Five factors were categorized as follows: *self-efficacy, future image, self-esteem, support and assurance from others*, and *joy of an addition to the family*. Cronbach's α coefficient for the overall scale was 0.89 and the α coefficient for sub-scale was 0.80 to 0.67, which confirmed the internal consistency of the scale. In addition, the correlation coefficient between this original scale and the Locus of Control scale was 0.516 ($p < 0.001$), which supported the criterion-related validity of this scale. The above largely supports the reliability and validity of this scale.

Key words

empowerment scale, childbirth education, prenatal, pregnant care, effective care

Introduction

Recently, the concept of empowerment focusing on individual responsibility and autonomy in achieving a healthy status has spread, and the main constituent of medical and nursing care has been shifting to the pregnant women themselves. Under such social contexts, it is necessary that childbirth education provide support that enables pregnant women to handle physical and emotional changes associated with pregnancy and experience a satisfying delivery. Childbirth education is carried out targeting individuals, couples, or groups at medical facilities and in local communities. Toda[1] suggested that the most important priority of such childbirth education is to support the empowerment of the pregnant women.

The term *empowerment* originates in the concept of *reinforce power, to transfer power*, or *to enable*. This may be considered a multidimensional concept involving a variety of ideas for which the definition differs depending on the context in which the term is used and the target of the empowerment, which can be individuals, organizations, or communities[2-5]. Qualitative study, related exploratory or verification

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study, and the development of scales related to empowerment that target nurses, patients, and community residents have been carried out in the field of nursing.

How, then, is the empowerment of pregnant women perceived in the context of childbirth education? Mitsuhashi[6], who proposed reformations in the field of childbirth within the nursing care system, utilized the definition provided by Gibson[7] to perceive empowerment as a concept focusing on human potential and as a process in the development of the ability of individuals to control and determine their lives. Moreover, Mitsuhashi[6] also suggested that empowerment means possessing the strength to make and to carry out decisions, and that it consists of interlocking actions based on interaction among individuals for the sharing of that strength. Rising[8] perceived empowerment as subjective correspondence to the conditions in which the individuals exist. Furthermore, Dumas[9] defined empowerment as equipping the target with the tools for self-support and the attitude to face difficult situations, and the ability to control in those situations.

With regard to the evaluation tool for the empowerment of pregnant women, Kovach[10] evaluated the health support program for low-income pregnant women and mothers of young children. This is a measurement of empowerment from the viewpoint of self-determination, decision-making, and self-sufficiency, although the details of the scale are not shown. No other documents showing scales for the empowerment of pregnant women were found. With regard to *self-efficacy*, considered to be one of the key concepts in the empowerment[11·12], self-efficacy scales for childbirth were created[13·14]. These scales are a measure of individual confidence in handling childbirth. It was verified that an increase in self-efficacy during childbirth education influences self-development after childbirth[13], and these scales are used as an evaluation index in childbirth education classes. However, the purpose and content of childbirth education classes have diversified along with the passage of time and changes in society; therefore, these self-efficacy scales can evaluate only a part of empowerment.

The Cochrane Systematic Review published in 2000[15] and 2007[16] reported that the effect of childbirth education was still unknown. The reasons for this, as indicated in the review, are the paucity of RCT design evaluation studies and the diversity of evaluation indexes. In order to evaluate the contribution of childbirth education to the improvement of empowerment in a comprehensive manner, enhance the understanding of pregnant women and increase their empowerment, we believe it is meaningful to develop an empowerment scale for pregnant women.

The purpose of this study was to develop an empowerment scale for pregnant women for use in the evaluation of childbirth education and increasing the empowerment of pregnant women, and to examine the reliability and validity of that scale.

Term Definition

The empowerment of pregnant women is defined as a sense of self-fulfillment and increased independence, gained through interaction with their environment and other individuals, leading to an increase in the spontaneous psychological energy to achieve the pregnancy and childbirth that they desire.

Methods

1. Scale draft creation and examination of the content validity

According to the literature regarding childbirth education and empowerment, components of empowerment[7,10,17-21] were classified as is shown in Table 1. Furthermore, considering the Japanese childbirth customs and Japanese concept of role of wives, the following eight sub-concepts were extracted from the measurement of empowerment in this study.

1) Self-efficacy: Confidence that allows the pregnant woman to feel that she is able to manage pregnancy and childbirth, and self-evaluation of physical ability.
2) Perceived control: Control and adjustment of events and situations during pregnancy and

Table 1. Components of empowerment in literature of nursing

Author	Year	Title	Component
Menon ST	2002	Toward a model of psychological health empowerment: implications for health care in multicultural communities	perceived control, perceived competence, goal internalization
Hata A, et al	2004	Application of the empowerment scale to schizophrenic patients ※	self-efficacy－self-esteem, power－powerless, community activism, optimism－control over the future, righteous anger
Bolton B, et al	1998	Development of measure of intrapersonal empowerment	personal competence, group orientation, self-determination, positive identity
Kovach AC, et al	2004	The impact of community health workers on the self-determination, self-sufficiency, and decision-making ability of low- income women and mothers of young children	self-determination, decision making ability, self-sufficiency
Nakano A, et al	1996	Characteristics of Psychosocial Nursing Care: The dimensions of psychosocial nursing care to promote the empowerment among the patients	feeling secure, having the courage to face reality, having one's own desire focusing on the future, being open about one's own feelings, exercising abilities, feeling joy, a sense of mastery
Rodwell CM	1996	An analysis of concept of empowerment	a partnership valuing self and others, mutual decision making, freedom to make choices, accept responsibility
Gibson CH	1991	Analysis of Empowerment	self-determination, self-efficacy, sense of control, motivation, self-development, learning, growth, sense of mastery, sense of connectedness, improved quality of life, better health, sense of social justice

※Created a Japanese version of the scale made by Rodgers (1997)

childbirth

3) Objectivization of images and goals: Realistic images and goals regarding pregnancy, childbirth, and becoming a parent.
4) Self-esteem: Individual acceptance and approval of being pregnant and a parent.
5) Emotional energy: Motivation to work positively on pregnancy and childbirth, and hope for the future.
6) Sense of responsibility for health: The pregnant woman's awareness of her responsibility for self and fetal well-being.
7) Selection and utilization of information and resources: Feeling secure that information and resources are available.
8) Support and assurance from others: Acceptance, respect, support and cooperation from the pregnant woman's key person and others.

In order to measure these sub-concepts, we created an item pool utilizing literature that qualitatively describe empowerment phenomena[6, 17, 22-24] and through a process of brainstorming. We examined the validity of the contents in collaboration with three researchers involved in tocology and specialists who manage their own midwife clinics and who conduct childbirth education, and discussed questions for inclusion in the survey. Next, we carried out a pre-test with the cooperation of five pregnant women to identify difficulties in the content of the questions and to determine whether the questions presented any difficulties for respondents. When difficulties were identified, questions were modified. Finally, we created a scale draft including 42 items. We utilized a 4-point Likert scale for responses, designating *I strongly agree* as 4 points, *I agree* as 3 points, *I disagree* as 2 points, and *I strongly disagree* as 1 point. In this scale, the higher the score is, the greater the degree of empowerment.

2. Subjects and data collection

In May 2007, we carried out a self-administered questionnaire survey on 173 pregnant women visiting outpatient clinics for prenatal care at obstetric facilities in the Hokuriku region. Researchers or collaborators at these facilities

provided subjects with a written explanation of the purpose of this study, the content of the survey, and ethical considerations. We delivered self-administered questionnaire survey sheets to those who agreed to participate in the study, and collected the answer sheets after they were completed. The content of the survey was as follows: Empowerment scale draft for pregnant women, Locus of Control (LOC) scale[25] for criterion-related validity analysis, and subject attributes including age, gestational age, parity, physical conditions during the survey, the presence or absence of fertility treatment, history of obstetric problem, and complications.

3. Analysis

1) Selection of items

Items to be deleted were determined utilizing Item-Total correlation and explanatory factor analysis. Criteria for deletion were items whose Item-Total correlation was less than 0.30[26], and items whose factor loadings were less than 0.30 and the items whose multiple factors had high factor loadings[27] according to the results of exploratory factor analysis.

2) Validity

We examined construct and criterion-related validity. As for construct validity, we examined the factor structure utilizing the principal factor method by setting the number of factors and the exploratory factor analysis with a promax rotation. As for the criterion-related validity, we examined the relationship utilizing an LOC scale by calculating the Pearson's product-moment correlation coefficient. The LOC scale was used to determine whether the cause of the results was the self (internal control) or other than the self (external control). We attempted to verify the hypothesis that there is a direct positive correlation between internal control, in which individuals work on issues in a self-determined manner, and empowerment.

3) Reliability

We calculated Croabach's α coefficient to examine internal consistency.

In addition, to examine difference, we used t-test, one-way analysis of variance, the Mann-Whitney U-test and Kruskal Wallis test. We used SPSS14.0 for Windows for all analyses.

4. Ethical considerations

This study was approved by the ethical committee of the Kanazawa University Graduate School of Medical Science (approval No: 40). It was clearly stated in documents given to all participants in the study that participation would be on a voluntarily basis, and refusal to participate study would not result in any adverse consequences. It was also stated that data would be statistically processed and would not identify individuals, that individual privacy would be protected, and that results would be presented in this study.

Results

We received responses from 173 pregnant women (collection rate: 100.0%), and 171 of these with valid responses were included as subjects of the analysis.

1. Attributes of the subjects

Table 2 shows the attributes of the subjects in this study. The age of subjects was between 17 and 40 years of age (mean ± SD: 29.1 ± 4.4),

Table 2. Subject attributes N=171

		Number	%
Age (years)	range 17 to 40		
	mean 29.1 ± 4.4 (SD)		
	less than 35	154	90.1
	35 or over	17	9.9
Gestational age (weeks)	range 6 to 40		
	mean 27.8 ± 9.8 (SD)		
	less than 22	46	26.9
	22 to 36	89	52.0
	37 or over	36	21.1
Parity	Primiparous	86	50.3
	Parous	85	49.7
Course of the pregnancy	In good condition	158	92.4
	Not in good condition	13	7.6
Physical conditions at the time of survey	Good	151	88.3
	Not good	20	11.7
Fertility treatment	Presence	20	11.7
	Absence	151	88.3
Desire for pregnancy at this time	Desired	149	87.1
	Not desired	22	12.9
History of obstetric problem	Presence	48	28.1
	Absence	123	71.9
Complications	Presence	0	0.0
	Absence	171	100.0

Table 3. Factor structure of an empowerment scale for pregnant women

	Item	Factor					Cronbach's coefficient α	
		Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ	subscale	overall
factor Ⅰ : Self-efficacy								
22	When I don't know what to do, I can probably research and solve the problem by myself.	0.854	-0.125	-0.076	-0.146	0.084	0.77	0.89
24	I can probably deal with what I am worried about.	0.822	0.198	-0.117	-0.081	-0.078		
6	I can probably take care of what I need to do during the pregnancy.	0.590	0.176	0.076	0.042	-0.268		
35	I can probably determine when to see the doctor.	0.557	0.210	0.006	0.081	-0.065		
32	I can always obtain information with which to consider the birth plan and facilities for childbirth.	0.378	-0.134	0.180	0.118	0.052		
2	I can obtain information I need from medical professionals.	0.341	-0.135	0.014	0.027	0.192		
factor Ⅱ : Future image								
3	I cannot imagine myself raising children. (R) †	-0.034	0.619	0.104	-0.006	-0.118	0.76	
38	I feel that it is a reality that I will be a mother.	0.068	0.574	0.068	-0.033	0.207		
14	I have my ideal image of childbirth.	0.026	0.491	-0.176	0.118	0.108		
26	I imagine how my delivery will be.	0.132	0.454	-0.116	0.187	0.116		
11	I cannot imagine an increase of my family. (R) †	-0.004	0.432	0.107	-0.061	0.315		
21	I imagine how my pregnancy will be.	0.142	0.351	0.197	0.069	0.140		
factor Ⅲ : Self-esteem								
29	I think my strength for delivery is weaker than other people's. (R) †	-0.102	0.036	0.744	-0.127	-0.085	0.80	
13	I probably can deliver like other people.	0.013	0.099	0.725	0.035	-0.318		
15	I am not confident about being pregnant. (R) †	-0.234	0.443	0.567	-0.032	0.021		
33	I have confidence about managing the pregnancy and that I can somehow make do.	0.306	-0.192	0.489	0.034	-0.035		
41	I am satisfied with my life.	0.156	-0.114	0.454	0.055	0.278		
10	When I don't know what to do, I can probably research and solve the problem by myself.	0.080	-0.105	0.437	0.086	0.258		
25	I can live with a positive attitude.	0.133	0.116	0.398	-0.003	0.190		
factor Ⅳ : Support and assurance from others								
28	My family and friends acknowledge my way.	-0.023	0.139	-0.147	0.845	-0.159	0.77	
39	My family and friends understand my current situation by saying "You can be as you are," and provide support.	-0.192	0.010	0.005	0.763	0.123		
37	I can consult with others and ask for help in order to achieve my goals.	0.105	0.038	-0.067	0.667	0.076		
5	I can ask for help when I need to.	0.030	-0.043	0.206	0.512	-0.169		
factor Ⅴ : Joy of an addition to the family								
31	I am looking forward to life after childbirth.	0.026	-0.122	-0.080	0.141	0.730	0.67	
23	I would like to enjoy my pregnancy.	-0.008	0.249	-0.108	-0.228	0.657		
18	I feel affection for my unborn baby.	-0.071	0.125	-0.089	-0.077	0.526		
16	I am excited about childbirth.	-0.078	0.214	-0.006	0.168	0.397		
	Correlation among factors Ⅰ	1						
	Ⅱ	0.265	1					
	Ⅲ	0.507	0.423	1				
	Ⅳ	0.385	0.351	0.500	1			
	Ⅴ	0.255	0.322	0.468	0.509	1		

Factor extraction method: Principal factor method, Rotation method: Promax with Kaiser normalization
† (R) means reverse item

gestational age was between 6 and 40 weeks (27.8 ± 9.8). Parity was divided nearly equal with 86 primiparous women (50.3%) and 85 parous women (49.7%). Thirteen subjects (7.6%) showed abnormalities during pregnancy, including threatened abortion, threatened premature delivery, and severe hyperemesis in pregnancy. Twenty subjects (11.7%) mentioned that they were in a poor physical condition at the time of the survey, 20 subjects mentioned that they had undergone fertility treatment, and 22 subjects (12.9%) mentioned that this pregnancy was not desired. Furthermore, 48 subjects (28.1%) had a history of obstetric problems, including miscarriage and premature birth. None of the subjects had complications.

We examined empowerment score by attributes. Subjects who had undergone fertility treatment showed a medium value of 91.5, a significantly higher level of empowerment than 86.0 of subjects who had become pregnant naturally. In addition, the data of subjects who did not want this

pregnancy showed a medium value of 79.5, a significantly lower level of empowerment than 87.0 for those who wanted the pregnancy. Furthermore, not significant, the data of parous showed a tendency toward a higher empowerment score than primiparous (p=0.062).

2. Selection of items and factor structure of the scale

First, we deleted the following five items as they showed less than 0.30 for Item-Total correlation: *I am worried about every little thing concerning the pregnancy (reverse item)* (r=−0.142); *I am happy about the pregnancy* (r=0.259); *The baby's healthy growth depends on my lifestyle* (r=0.268); *Medical professionals treat me respectfully* (r=0.272); *It's not my baby's fault, but I feel rueful (reverse item)* (r=0.289). Next, we carried out an exploratory factor analysis. Initially, we assumed eight factors; however, we set the number of factors to between 5 and 10 for the analysis. Next, the deletion of items with a factor loading of less than 0.30 and items having several factors with high factor loadings were considered. We ultimately selected 27 items adopted an analytics five factor (Table 3). We determined that the first factor "*self-efficacy*" included six items, the second factor "*future image*" included six items, the third factor "*self-esteem*" included seven items, the fourth factor "*support and assurance from others*" included four items, and the fifth factor "*joy of an addition to the family*" had four items. In addition, according to the results of correlation among factors, between the first factor "*self-efficacy*" and the third factor "*self-esteem*" (r=0.507), the third factor "*self-esteem*" and the fourth factor "*support and assurance from others*" (r=0.500), and the fourth factor "*support and assurance from others*" and the fifth factor "*joy of an addition to the family*" (r=0.509) showed relatively strong positive correlation. The first factor "*self-efficacy*" showed a slightly low correlation with the second factor "*future image*" (r=0.265) and the fifth factor "*joy of an addition to the family*" (r=0.255) (Table 3). All items deleted from the scale draft are shown in Table 4.

Table 4. Deleted items

	Deleted items
1	It's up to me whether I have a healthy pregnancy or not.
4	Medical professionals treat me respectfully
7	I have my own goals for pregnancy.
8	I can decide everything according to my wishes.
9	I can think positively and try my best.
12	I am happy about the pregnancy
17	I want to do as much as I can for the delivery.
19	Medical professionals provide treatment and care in consideration of my desires.
20	I know what I can do and what I need in terms of support from others.
27	I am worried about every little thing concerning the pregnancy. (R)†
30	The baby's healthy growth depends on my lifestyle
34	I like that I am interested in various things.
36	I cannot enjoy the pregnancy. (R)†
40	I can prepare for childbirth by paying attention to my health during the pregnancy.
42	It's not my baby's fault, but I feel rueful. (R)†

† (R) means reverse item

3. Criterion-related validity

The correlation coefficient between LOC scale scores and this scale was r=0.517 (p<0.001), reflecting a relatively strong positive correlation. The correlation coefficients of the LOC scale scores and each sub-scale were as follows: the first factor "*self-efficacy*" showed r=0.302, the second factor "*future image*" showed r=0.375; the third factor "*self-esteem*" showed r=0.473; the fourth factor "*support and assurance from others*" showed r=0.414; and the fifth factor "*joy of an addition to the family*" showed r=0.278. All

Table 5. Correlation between an empowerment scale for pregnant women and Locus of Control scale

	Empowerment scale for pregnant women (overall scores)	I	II	III	IV	V
		Self-efficacy	Future image	Self-esteem	Support and assurance from others	Joy of an addition to the family
Locus of Control Scale	0.517***	0.302***	0.375***	0.473***	0.414***	0.278***

Pearson's product-moment correlation coefficient
***p -value<0.001

showed significant positive correlation ($p<0.001$) (Table 5).

4. Reliability

Cronbach's α coefficient for the overall scale was 0.89 and those for the sub-scales were between 0.80 and 0.67, and only the fifth factor showed less than 0.70 (Table 2).

Discussion

1. Validity of the empowerment scale for pregnant women

We created an empowerment scale for pregnant women based on a review of literature and conducted a factor analysis. As a result, we extracted five factors; namely, *self-efficacy, future image, self-esteem, support and assurance from others*, and *joy of an addition to the family*. Initially, we set the following eight sub-concepts: *self-efficacy, perceived control, objectivization of images and goals, self-esteem, emotional energy, sense of responsibility for health, selection and utilization of information and resources*, and *support and assurance from others*; however, *perceived control* and *selection and utilization of information and resources* were absorbed into other factors. According to the reports by Menon[17] and Gibson[7], perceived control was a major concept. However, it was not extracted as a factor in this study. Compared with western culture that emphasizes self-responsibility and independence, the Japanese culture is more passive, and this is believed to have affected the awareness of the subjects. Some items related to emotional energy were absorbed into sub-concept ; *joy of an addition to the family,* and others were absorbed into other factors. This sub-concept is equivalent to hope and expectation for the future described by Nakano[20]. On the other hand, *sense of responsibility for health* was not retained in the scale. The reason is that the item to measure the sense of responsibility for health was deleted during item selection by Item-Total correlation, and the items retained were not enough to make up one factor.

The LOC scale and the scale created in this study showed relatively strong positive correlation for criterion-related validity[28]. In other words, the hypothesis that there is a direct positive correlation between internal control and empowerment, was proven, showing criterion-related validity. Certain sub-scales exhibit a weak relation with LOC; therefore, there is a need for further examination on criterion-related validity using other scales.

2. Reliability

Cronbach's α coefficient in the overall scale was 0.89, which showed high internal consistency. Only the fifth factor, *joy of an addition to the family*, showed an α coefficient of 0.67, which was less than the standard value 0.70[29]. In general, if the number of items are small, Cronbach's α coefficient tends to show low level, and it is desirable that one factor consist of three or more items. Therefore, we considered that the α coefficient of approximately 0.70 in four items did not deny internal consistency.

3. Potential clinical application of the scale and future issues

Kovach[10] evaluated a health educational program using an empowerment scale that he had created. A comparison of empowerment scores before and after the program revealed that the degree of empowerment changed. In other words, this comparison revealed that empowerment can be affected by intervention. Comparing the sub-concepts in both Kovach's scale and this scale, common contents were included in both concepts, including the setting of goals and hope for the future, although category names were different; therefore, the clinical applicability of this scale is suggested. Additionally, it was revealed that empowerment scores differed depending on the presence or absence of fertility treatment, and whether the subjects want pregnancy or not. This shows that this scale can measure the empowerment of pregnant women by the difference of the attributes, and that it can be adopted for clinical use. Furthermore, the relation among factors can be used effectively for clinical purposes, for example, with regard to two factors, "*self-esteem*" and "*support and assurance from others*," factors that showed a strong relation, it is assumed that intervention to obtain support from

others would increase the self-esteem of pregnant woman.

Although development of an empowerment scale for pregnant women has just begun, it is expected that the objective quantification of empowerment will lead to a clarification of associations with other factors and further empirical study regarding empowerment efficacy. The ability to evaluate the level of empowerment also means the possibility of identifying powerless conditions, which can contribute to support for the empowerment of pregnant women.

This scale was subjected to cross-sectional research, and it is possible to verify its reliability using test-retest and other methods via longitudinal research. In addition, it is also necessary for verification of the validity of this scale to carry out a survey on a different group of pregnant women. This scale depends on the measurement items; therefore, items and a further examination of the construct are required to refine this scale.

Conclusion

We developed an empowerment scale for pregnant women as an evaluation index in childbirth education, and examined its reliability and validity. This scale consisted of five factors, *self-efficacy*, *future image*, *self-esteem*, *support and assurance from others*, and *joy of an addition to the family* and a total of 27 items, and the validity and reliability of the scale was largely proven.

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妊婦のエンパワメントスケールの作成

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要　　旨

目的：妊婦のエンパワーメントとは、他者や環境との相互作用を通じて、自分が望むような妊娠生活や出産ができるように、内発的な心理エネルギーが増大することである。本研究の目的は、妊婦のエンパワーメント支援と出産前教育の評価に活用するために、妊婦のエンパワーメント尺度を開発し、その信頼性と妥当性を検討することである。

方法：助産学および母性看護学領域を中心にエンパワーメントに関する文献レビューを行い、助産学研究者３名による構成概念および内容表現の検討、およびプレテストにより、42項目からなる尺度を作成した。北陸地方の産科施設で健診を受けている妊婦173名を対象に無記名自記式質問紙調査を行い、有効回答が得られた171名を分析対象とした。

結果：I-T相関、探索的因子分析による検討から、最終的に27項目５因子解を採用した。第１因子「Self-Efficacy」（６項目）、第２因子「将来のイメージ」（６項目）、第３因子「Self-Esteem」（７項目）、第4因子「周囲からの支持・保証」（４項目）、第５因子「家族が増える楽しみ」（４項目）と解釈できた。尺度全体のCronbach's α係数は0.89、サブスケールのα係数は0.80～0.67であることから、尺度の内的整合性が確認された。また、本尺度の合計得点とLocus of Control尺度得点との相関係数は0.517（$p<0.001$）であることから、尺度の基準関連妥当性が支持された。以上より、本尺度の信頼性と妥当性は、概ね支持された。