

Course of patients with ischemic heart disease after intervention for the modification of the Type A behavior pattern – Changes in behavior pattern, QOL, stress, and cognitive misperception –

Kazumi Kawamura Michiko Inagaki

Abstract

The purpose of this study was to perform nursing interventions for behavioral modification in patients after the development of ischemic heart disease, and evaluate subsequent changes and the effects of the interventions. For intervention, an educational/cognitive therapeutic approach that mainly enables patients to become aware of their Type A behavior pattern (Type A hereafter). This approach aims at inducing changes in their daily life pattern and subsequent changes in their lifestyle. Changes after intervention were evaluated in 4 items: Type A, QOL, stress perception, and cognitive misperception. The subjects were 6 patients with Type A behavior. Assessment after intervention was performed 6 years after the initiation of intervention, and the following results were obtained.

1. Comparison between the onset of the disease and 6 years after intervention showed changes in Type A tendency in 5 patients, of whom 2 showed a change to the Type B behavior pattern (Type B). Comparison between the first survey and the survey 6 years after intervention also showed changes in Type A tendency in terms of the mean score in all subjects.
2. QOL improved in all patients, and a change in mood was effectively used in life. Family's support was obtained, and exchange with family members increased.
3. Concerning stress perception, the score for physical/psychological symptoms on the stress scale slightly increased while the scores for personality traits and stressors slightly decreased.
4. Cognitive misperception improved in 5 patients but did not change in the other.

Thus, it was difficult to directly change the behavior pattern of the subjects by intervention for behavioral modification. However, cognitive misperception improved after intervention, resulting in a reduction in stress and improvement in QOL.

Key words

patient with ischemic heart disease, type A behavior pattern,
modification of behavior pattern, educational/cognitive therapeutic approach,
quality of life

INTRODUCTION

Friedman and Rosenman in the U.S. were the first to suggest the Type A behavior pattern (Type A hereafter) as a risk factor of ischemic heart disease in 1959. They reported that patients with angina pectoris or myocardial infarction frequently have a specific behavior pattern¹⁾. This pattern is characterized by a desire to achieve goals, strong competitive drive,

tendency to hostility, constant desire to achieve high recognition and advancement, absorption in excess work, sense of time urgency, constant attempts to increase the speed of psychological/physical activity, and high psychological/physical sensitivity. They termed this behavior pattern Type A.

This concept was introduced to Japan, and its studies were initiated in the latter half of the 1970s²⁾.

In Japan, Maeda in 1989 reported the usefulness of interventions by medical workers to change Type A to a more gentle behavior pattern in people at the risk of ischemic heart disease for the prevention of its development and recurrence³⁾. On the other hand, stress as well as Type A has been shown to be a risk factor of ischemic heart disease. In addition, stress has been reported to be strongly perceived by people with Type A, which has been suggested to be associated with a decrease in the reserve capacity of the parasympathetic nerve due to Type A⁴⁾. Therefore, patients with ischemic heart disease showing Type A not only have this risk factor but also are susceptible to exposure to stress as another risk factor. Therefore, the modification of Type A is very important. A certain situation is perceived as stress by some people but not by others, which is determined by the interpretation of the situation. Therefore, the cognitive method is associated with whether a certain situation is perceived as stress. When there is a misperception, even trivial situation are perceived as stress. Therefore, the absence of cognitive misperception is important in maintaining a stable psychological condition.

In patients with ischemic heart disease showing Type A, nursing measures for the modification of Type A should be evaluated to maintain a stable psychological condition. However, in such patients, the behavior pattern remains Type A after the development of the disease due to difficulty in behavioral changes. Therefore, we performed interventions in patients who could not change Type A after the onset of the disease, and followed up their subsequent courses. To clarify the effects of nursing intervention, a questionnaire survey was performed before and after intervention, and changes in Type A, QOL, stress perception, and cognitive misperception were evaluated.

Outline of the study

In the first survey, we evaluated the patient's behavior pattern (Type A tendency), QOL, stress perception, and cognitive misperception using measurement instruments (For the behavior pattern and cognitive misperception, the subjects were asked to remember the situation at the onset of ischemic

heart disease, and the state at the onset was also investigated.) Subsequently, interventions were performed for the modification of behavior. A survey was performed again 6 years after intervention, and the results were compared with those in the first survey.

Methods

1. Subjects

The subjects were 6 patients with ischemic heart disease who regularly visit the outpatient clinic of the cardiovascular medical department of a general hospital. All subjects had returned to society at the time of the survey. An explanation of this study was given with the cooperation of the primary physician at the outpatient clinic, and consent was obtained from all subjects.

2. Measurement instruments

1) Measurement of the behavior pattern

Type A tendency was evaluated using the "Type A tendency discrimination table" developed by Maeda⁵⁾ (Table 1). This scale was developed for the simple determination of the presence or absence of Type A tendency in patients as an auxiliary method for the interview at the outpatient clinic. As Table 1 shows, there were 12 contents associated with the sense of time urgency, absorption, thoroughness, confidence, tension, scrupulosity, quick-temperedness, and the competitive drive.

The subjects selected an answer for each question among "Usually", "Sometimes", and "Hardly", and 2, 1, and 0 point, respectively, were given. In addition, the score for 3 questions showing a marked difference between the subjects and the control group ("Are you a perfectionalist?", "Do you have confidence in yourself?", "Are you punctual in everything you do?") was doubled, and the total score was calculated (full score, 30).

The presence or absence of Type A tendency was determined based on the total score. Total scores of ≥ 17 were considered to indicate Type A while those of ≤ 16 were considered to indicate Type B.

The reliability and validity of this scale had already been confirmed, and the diagnostic concordance rate between this scale and the translation of the Jenkins Activity Survey (JAS) as the original of the

questionnaire for Type A was 82.8%⁶⁾. This scale was used not only for the differentiation between Types A and B as the original usage but also for the measurement of the degree of Type A tendency based on the score.

2) Measurement of QOL

The questionnaire on "Inventory of Daily Life Control in Living with Chronic Ischemic Heart Disease" developed by Kuroda ("IDLC" hereafter)⁷⁾ was used (Table 2). This questionnaire consisting of 98 items was developed based on the view that patients maintain and adjust habitual behavior so as to satisfy their basic desires and cope with various problems encountered in daily life due to the presence of the disease by their own methods. For each question, one answer is selected among 5 grades from "definitely agree" to "definitely disagree". To increase the accuracy of the scale, 61 of the 98 items are desirable behaviors, and the other 37 are undesirable behaviors. For the undesirable behaviors, reverse scoring is performed. Therefore, high scores indicate high QOL. The reliability and validity of this questionnaire are being confirmed at present. Though a revision of this scale to 45 items was reported in an

academic conference⁸⁾, we used the 98-item scale in this study so as to evaluate patients' daily life in detail. The degree of QOL was measured based on the total score (maximum score, 490).

3) Measurement of stress perception

The degree of stress in daily life in the subjects was evaluated using the "Stress check list" developed by Tokyo Institute of Psychiatry (Table 3). This stress scale was developed by Okabe et al.⁹⁾ and consists of a total of 50 questions (full score, 100). Global assessment based on the total score and assessment based on the scores for the following 5 subscales are performed: 1) physical/psychological symptoms, 2) personality characteristics, 3) Type A, 4) stressors, and 5) coping behavior; full score for each subscale, 20). Each subscale consists of 10 questions (Table 3), and an answer for each question is selected among 3 choices, and scoring is performed (0, 1, and 2, respectively). Both a higher total score and a higher score for each subscale indicate higher degrees of problems. The reliability of this scale has been confirmed. In this study, 3 subscales ("physical/psychological symptoms", "personality characteristics", and "stressors") were used.

Table 1 Type A tendency discrimination table

Place a circle (○) in the applicable space concerning the situation before the onset of heart disease
at present

- 1) Do you have busy daily life?
- 2) Do you feel being pressed for time in your daily life?
- 3) Do you easily become enthusiastic over your job or other things you do?
- 4) When you are absorbed in something, do you feel difficult to change your mind?
- 5) Are you a perfectionalist?
- 6) Do you have confidence in yourself?
- 7) Do you easily feel tense?
- 8) Do you easily feel irritated or angry in your mind?
- 9) Are you punctual in everything you do?
- 10) Are you unyielding?
- 11) Do you have an intense temper?
- 12) Do you easily become competitive about job or other things you do?

Usually	Sometimes	Hardly

Total score _____

Table 2 Items of the questionnaire of "Inventory of Daily Life Control in Living with Chronic Ischemic Heart Disease"

Item No.	Item contents	Reverse scoring items
1	When I think I overdid myself, I have more rest and sleep.	
2	I am reluctant to take the trouble to get exercise.	※
3	I cut down on the intake of foods with high fat/cholesterol contents.	
4	I have a deep sleep.	
5	Recently, my acquaintanceship has become narrower, and friends have decreased.	※
	:	
40	I avoid crowded places.	
41	I know why my physical condition changes.	
42	It is helpful of my family to know meals that are good for my body.	
43	I do not travel these days.	※
44	I know that mild exercise is necessary.	
	:	
93	My physical condition becomes poor when I do not regularly take drugs.	※
94	I care about others' treating me as a patient.	※
95	I can consult with physicians when I have problems.	
96	My family reminds me to take drugs when I forget it.	
97	I do not have confidence in various things after developing the disease.	※
98	I do not want others to notice my disease and symptoms.	※

Table 3 Stress check list developed by Tokyo Institute of Psychiatry

Answer the following 50 items concerning your health and life.

(Place a circle (○) in the applicable space.)

	Physical/psychological symptoms	Absent	Sometimes present	Always present
1	I easily become fatigued and can not get over the fatigue.			
2	I have headache or heavy headedness.			
3	I have a poor appetite or stomach heaviness.			
:	:			
	Personality traits	Not applicable	Somewhat applicable	Applicable
11	I tend to become anxious about little things.			
12	I care and stick to small things.			
13	I have no confidence in various things.			
:	:			
	Stressors	Not applicable	Somewhat applicable	Applicable
31	Marked changes recently occurred in my lifestyle.			
32	I experienced separation from or bereavement of family members/close friends.			
33	I have a marked burden due to my body.			
:	:			

4) Measurement of cognitive misperception

To determine the presence or absence of cognitive misperception in the recognition of situations, we developed a questionnaire ("cognitive misperception" scale hereafter, Table 4) using "David D Burns' Ten

Forms of Twisted Thinking" as a reference¹⁰⁾. This scale evaluates the degree of the presence of the following 10 patterns as the characteristics of the way of thinking in patients: "all-or nothing thinking", "overgeneralization", "mental filter", "discounting the

positive", "jumping to conclusions", "magnification or minimization", "emotional reasoning", "should statements", "labeling and mislabeling", and "personalization/blame". An answer was selected among 5 choices from "absolutely agree: 5 points" to "absolutely disagree: 1 point", and the total score was calculated. The contents of the questions were concrete daily activities of living representing each pattern. "Jumping to conclusions" was classified into "mind reading" and "the fortune teller error". Therefore, the total number of items was 11, and the full score was 55.

5) A questionnaire on the way of spending daily life

Items asking the present job or the way of spending daily life in subjects without a job were included, and the subjects freely described answers.

3. Data Collection

At the time of both the first survey and survey after 6 years, we handed the measurement instruments 1)-5) to the patients when they visited the outpatient clinic, asking return by mail. In addition, their status (age, duration of the disease, and the presence/absence and types of diseases associated with heart disease) in the subjects after the first survey was evaluated. The

disease control state was determined to be good or poor by the presence or absence of admission due to episodes associated with ischemic heart disease.

4. Intervention methods

Interventions were performed by Maeda's educational therapeutic approach and cognitive therapeutic approach¹¹⁾ as a reference during the waiting time at the outpatient clinic or the time the subjects hoped. The time of each intervention was 30 minutes-1 hour. The educational therapeutic approach has the following contents: 1) The behavior pattern of patients is assessed so that they can become aware that they have Type A. 2) The risks of Type A and the effects of its modification are explained so that patients could decide to change Type A. 3) Patients change first what can be readily changed and deliberately slow down daily activities to reduce irritation. 4) The amounts of work and responsibility are reduced. This approach aimed at inducing changes in daily activities of life in patients by education and enlightenment and subsequently changes in their lifestyle. In the cognitive therapeutic approach, patients consider the reason that they can not change Type A and infer and notice anxiety, irritation, and

Table 4 "Cognitive misperception" scale

		Name _____				
before the onset of heart disease at present	}	I would like to ask you about the characteristics of your way of thinking. Circle (○) one applicable number among the numbers from 1 to 5 on the right line.				
		Absolutely agree	Somewhat agree	Somewhat disagree	Almost disagree	Absolutely disagree
1. You see things in black and white or all or nothing categories. If your performance falls short of perfect, you see yourself as a total failure. Examples: "Failure is <u>in no way</u> allowed." "This is a <u>complete</u> failure."		5	4	3	2	1
2. You see a single negative event as a never-ending pattern of defeat. Examples: "I am <u>always</u> scolded." "Because I was ignored by A, I am disliked by everyone."		5	4	3	2	1
3. You try to motivate yourself with "should" or "shouldn't". If not so, you feel guilt. Examples: "I <u>should</u> be punctual." "Men <u>should</u> not cry."		5	4	3	2	1
:						
:						
11. Even when you are not responsible, you think you are responsible. When you are partly responsible, you shift the responsibility onto others and blame them. Examples: "The meeting failed <u>due to my fault</u> ." "If you had more consideration, I could have been happy."		5	4	3	2	1

hostility that lie behind Type A, and therapists and patients evaluate measures to alleviate or eliminate these feelings. The educational therapeutic approach is considered to be useful in some patients in whom modification is difficult.

In the intervention, the patients were asked about Type A behavior in their daily life. Subsequently, we explained the negative influences of the continuation of Type A behavior to the patients so that would consider modifying their behavioral patterns.

Though intervention was performed only once, we considered that behavioral patterns would change over a long period.

5. Data Analysis

Differences in the score for each measurement instrument between the first survey and the survey after 6 years were analyzed by the t-test and Wilcoxon signed rank sum test. For analysis, Stat View Ver 5.0 was used, and $p < 0.05$ was regarded as significant. In addition, differences in the way of spending daily life were compared.

6. Ethical considerations

The subjects were told that their participation in this study is voluntary, the refusal to participate has no influences on the subsequent provision of medical care, the data obtained are used only for this study,

and their privacy is protected.

Results

1. Background of the subjects (Table 5)

All the 6 subjects were males, and their mean age was 68.8 ± 4.1 years. The duration of the disease was defined as the period from the first attack of angina pectoris (onset) to the present survey.

Four patients had a job. At the time of the survey after 6 years compared with the first survey, their work changed to contents with time flexibility or desk work, or the working days decreased to 4 days a week without changes in the contents of work, reducing physical burden.

2. Score in the Type A tendency table and changes in the behavior pattern (Table 6)

The mean score in the Type A tendency table was slightly lower in the survey after 6 years (18.8 ± 4.6) than in the first survey (19.3 ± 1.9). The score increased in 3 of the 6 patients but did not change in 1 compared with the first survey. In the first survey, all patients had Type A. However, the survey after 6 years showed a change to Type B in 2 patients. The mean score in the survey after 6 years was significantly lower ($p < 0.05$) than that at onset (23.2 ± 4.7). The score decreased in 5 patients but increased in the

Table5 Background of the subjects

Gender	All were males	
Mean Age	68.8 ± 4.1 years (65 ~ 75years)	
Disease	Old myocardial infarction	3
	Angina pectoris	3
Mean duration of the disease	10.5 ± 4.5 years (7.0 ~ 19.0years)	
Presence /absence of disease associated with heart disease	Present	4
	Absent	2
Types of disease associated with heart disease	Hyperlipidemia	3
	Hypertension	2
Disease control state	Presence of history of admission	1
	Absence of history of admission	5
Job	Have a job	4
	No job	2

other, who had a history of admission during the 6-year period.

3. Changes in QOL (Tables 7 and 8)

The IDLC showed an increase (2-21 points) in the total score in the survey after 6 years compared with the first survey in all the 6 patients. The mean score in the survey after 6 years (355.2 ± 34.9) was significantly higher ($p < 0.05$) than that in the first survey (344.8 ± 29.4), indicating high QOL.

In all the 6 patients, the number of items showing an increase in the score was higher than that of items

showing a decrease.

There were no items for which all patients showed an increase in the score, but 5 patients showed an increase in the following 3 items: "I eat in spite of myself" (reverse scoring item: high scores indicate high QOL), "I sometimes go hiking or on a picnic for a change", and "My family reminds me to take drugs when I forget it."

4. Changes in the score on the stress check list (Table 9)

Among the 3 subscales of the stress check list, the

Table 6 Changes in the score in the Type A tendency discrimination table

Patient No.	Type A score at onset	Type A score in the first survey	Type A score in the survey after 6 years
1	22	19	24
2	27	22	22
3	17	18	13
4	30	21	22
5	20	17	18
6	23	19	14
Mean	23.2	19.3	18.8
SD	4.7	1.9	4.6

Table 7 Changes in the total score in the IDLC

Patient No.	Total score in the first survey	Total score in the survey after 6 years	Total score in the survey after 6 years – that in the first survey
1	344	351	7
2	382	401	19
3	295	297	2
4	362	366	4
5	352	373	21
6	334	343	9
Mean	344.8	355.2	10.3
SD	29.4	34.9	7.9

Table 8 Changes in the score in the IDLC

Patient No.	Number of items showing an increase in score	Number of items showing a decrease in score	Number of items showing no changes in score
1	32	26	40
2	28	19	51
3	32	27	39
4	29	23	46
5	30	16	52
6	31	18	49
Mean number of items	30.3	21.5	46.2
SD	1.6	4.5	5.6

mean score for physical/psychological symptoms was slightly higher in the survey after 6 years (8.2 ± 1.8) than in the first survey (7.2 ± 2.0), and that for personality characteristics was slightly lower in the survey after 6 years (12.8 ± 2.1) than in the first survey (13.2 ± 1.0), and that for stressors was also slightly lower in the survey after 6 years (6.5 ± 2.3) than in the first survey (8.2 ± 3.9).

5. Changes in the score on the "cognitive misperception" scale (Table 10)

The score on the "cognitive misperception" scale decreased after 6 years compared with the first survey in 5 of the 6 patients. The mean score in the survey after 6 years (28.0 ± 4.8) was markedly lower ($p < 0.05$) than that in the first survey (35.0 ± 7.5).

Discussion

Though the mean duration of the disease was long (10.5 years) in the subjects of this study, the disease control was often good. This may be partly because they regularly visited the outpatient clinic and continued to take drugs according to instructions.

Regarding this point, we speculate that their unfavorable experience of previous chest pain attacks

as a characteristic of patients with ischemic heart disease enhanced the motivation to continue necessary care behavior. In addition, "scrupulosity and earnestness" as characteristics of Type A may have had favorable influences on disease care behavior such as regular visits to the hospital and oral administration associated with disease control. In daily life, most patients restricted their work contents compared with the previous situation, which may be associated with their good care behavior. In this study, the mean age of the subjects was 68.8 years. They were over their prime and worked after retirement or as part-time employees, which may have reduced the amount and responsibility of work as well as the physical burden. These factors may have affected the disease control state.

The behavior pattern was changed to Type B in only 2 patients, which suggested difficulty in behavioral modification. The Type A score decreased during the period from onset to the first survey in most patients but increased again during the period from the first survey to the survey after 6 years, suggesting difficulty in the maintenance of Type B after modification. This problem may require cognitive

Table 9 Changes in the score on the stress check list

Patient No.	Physical/psychological symptoms in the first survey	Physical/psychological symptoms in the survey after 6 years	Personality characteristics in the first survey	Personality characteristics in the survey after 6 years	Stressors in the first survey	Stressors in the survey after 6 years
1	6	6	12	13	4	6
2	6	10	13	16	4	3
3	8	9	13	14	6	9
4	10	10	13	13	12	9
5	5	6	13	11	12	7
6	9	8	15	10	11	5
Mean	7.3	8.2	13.2	12.8	8.2	6.5
SD	2.0	1.8	1.0	2.1	3.9	2.3

Table 10 Changes in the score on the cognitive misperception scale

Patient No.	Before onset	Survey 6 years after the first survey	Before onset – Survey 6 years after the first survey
1	22	22	0
2	38	25	13
3	30	29	1
4	39	34	5
5	42	33	9
6	39	25	14
Mean	35.0	28.0	7
SD	7.5	4.8	6

therapeutic approaches in the future. However, in this study, even in the absence of behavioral modification, the subjects maintained a good control state. This may be also associated with the improvement in QOL in the survey after 6 years. Thus, subjects' perception of their own life, i.e., their perception of satisfaction with their own life may be important to maintain a good control state. In particular, it is of interest that 5 of the 6 patients began to have a change of mood in their life and perceived their family's support in care behavior. The background associated with this situation in the subjects should be also evaluated in the future.

Stressors as factors causing stress decreased in the survey after 6 years. There are many stressors in daily life such as the living environment, contents of work, economical problems, family relationship, and the relationship with friends. Stressors can be classified into physical, social, and psychological factors. In addition, stress is produced even though stress is in fact absent, which also becomes a stressor. For example, people undergo an examination and worry about poor results though they have not yet obtained them. This is the production of stress. The production of stress in the mind though it is unclear whether the situation will occur has been suggested to be a major characteristic of psychological stressors¹²⁾. In this survey, stressors in a wide range such as the presence of worries about the family or anxiety about the body were investigated. However, the reason for these worries and causes of anxiety should be also evaluated to find the reason for the reduction in stressors.

Whether a situation is stressful or comfortable depends on the way it is perceived. In this study, cognitive misperception was evaluated based on the score on the "cognitive misperception scale" alone. In the survey after 6 years, the score decreased in most patients, suggesting improvement in cognitive misperception. This may be associated with the reduction in stress.

Conclusions

We performed a questionnaire survey before and after behavioral modification counseling in 6 patients with ischemic heart disease showing Type A, and obtained the following results.

1. Type A tendency improved in 5 patients

compared with the state at the onset of the disease. Of the 5 patients, 2 showed modification to the Type B behavior pattern (Type B). In the survey 6 years after the first survey (behavioral modification intervention), the score in the Type A tendency discrimination table increased in 3 patients, but the mean score in all patients slightly decreased.

2. QOL improved in all patients, and exchange with the family increased. In the "disease" questionnaire, the number of items showing an increase in the score was higher than that of the items showing a decrease.

3. The mean score for physical/psychological symptoms among the 3 subscales of the stress check list slightly increased in the survey after 6 years compared with the first survey, and the mean scores for personality characteristics and stressors slightly decreased.

4. Cognitive misperception improved in 5 patients but did not change in the other.

5. All patients followed instructions in care behavior such as regular visits to the outpatient clinic. One patient had a history of admission due to recurrence of attacks during the 6-year period. Only this patient showed an increase in Type A tendency and no changes in cognitive misperception after 6 years compared with the onset of the disease.

Acknowledgment

We express deep gratitude to patients with ischemic heart disease for their participation and cooperation in this study.

This is a part of studies supported by a Grant-in-aid for Scientific Research (C) (2000-2002) from the Japan Society for the Promotion of Science (Project No. 12672317). A part of this study was reported in the 51st conference of the Japanese College of Cardiology.

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タイプA行動修正のための介入を行った虚血性心疾患患者の経過 —行動パターン、QOL、ストレスおよび認知の歪みの変化—

河村 一海, 稲垣美智子

要 旨

本研究の目的は虚血性心疾患発症後の患者に行動修正のための介入を行い、介入後の変化を追跡調査し、看護の取り組みについて検討することである。介入方法は患者自身に自分がタイプAであることを気づかせることを中心とした教育・認知療法的アプローチである。この介入により患者が日常の生活行動に変化をおこし、やがてライフスタイルの変化まで引きおこそうとすることをねらっている。介入による変化として測定したのは、タイプA行動パターン（以下タイプA）、QOL、ストレス認知、認知の歪みの4つである。対象者はタイプAの患者6名、介入後の評価は6年後とした。結果は下記の5点である。

1. 発症時と介入6年後を比較するとタイプAの傾向は5名が修正されており、うちB型行動パターン（タイプB）に行動修正されていた者は2名であった。また初回調査時と介入6年後においても全体としてはタイプAの傾向が修正されていた。

2. QOLは全員が向上しており、気分転換をうまく生活に取り入れていた。また家族からもサポートを得られており、家族との交流も以前より増えていた。

3. ストレス認知については、ストレス尺度の心身症状の得点が若干上昇しており、性格特性とストレスラーの得点が若干低下していた。

4. 認知の歪みは5名が改善、1名が変化なかった。

以上より、行動修正のための介入を被験者の行動パターンの修正に直接つなげることは困難なことであったが、介入により認知の歪みが改善されたことで被験者のストレスが軽減され、結果的にはQOLを向上させることができたのではないかと示唆される。