

Development of a self-evaluation tool for evaluation of nurse teaching styles in diabetes patient education – Identifying characteristics of teaching in actual practice by self-evaluation –

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Abstract

The purpose of this study is two-fold. The first purpose is to clarify diabetes patient education carried out by nurses and validate the hypothetical classification of nurse teaching styles through a self-evaluation of the awareness and behavior that distinguish the characteristics of education by nurses who are involved in diabetes patient education. The second purpose is to establish *a self-evaluation tool for evaluation of nurse teaching styles* as a means of intervention in nursing education. We conducted a nationwide questionnaire survey targeting nurses who are involved in diabetes patient education.

In a primary survey of nurses involved in diabetes patient education (n=1,096) self-evaluated teaching styles were classified into *a teaching style which provides general knowledge* and *a teaching style which shows an understanding of the realities of patient living conditions and attitudes*. Nurses identifying their teaching style as one which provides general knowledge accounted for 42.2% of the total, and 57.8% of the total identified their teaching style as showing an understanding of the realities of patient living conditions and attitudes. Responses from nurses involved in diabetes patient education in Japan validated the categories of nurse teaching styles. In a secondary survey (n=400), the validity of the *self-evaluation tool for evaluation of teaching styles of nurses* who are involved in diabetes patient care was confirmed in other groups, and a way of looking back on diabetes nursing care to understand the awareness and behavior of the practice at a specific level from the viewpoint of teaching style was identified. This *self-evaluation tool for evaluation of nurse teaching styles* is expected to prove useful in educational intervention in the future.

Key words

diabetes patient education, nurse teaching style, self-evaluation tool, nationwide questionnaire survey, validation of hypothetical classification

Introduction

The awareness and behavior of individual nurses involved in diabetes patient education are characterized by factors such as special knowledge, experience, recognition and judgment, factors that are based on the individual nurse's view of nursing care, atmosphere they have, and words

and actions expressed while interacting with patients. These characteristics are referred to as *teaching style*, and are divided into two categories from previous research¹⁻³: *a teaching style which shows an understanding of the realities of patient living conditions and attitudes*, by which positive results can be achieved in diabetes patient

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education, and a teaching style which does not show an understanding of the realities of patient living conditions and attitudes, by which positive results cannot be said to be achieved in diabetes patient education. Teaching achievement is defined as improvement in patient self-management ability⁴. Nurses can facilitate such improvement by focusing on the patient's ability to utilize knowledge of diabetes, determine daily treatment activities independently and by encouraging the patient to nurture such ability.

However, the process by which these teaching styles are developed has not yet been clarified. A previous study identified cases in which nurses found value in effective practice of nurse who was in leadership position and attempted to alter their teaching styles by reflecting^{5,6} the observed educational techniques in their own practice in a conscious effort to develop a teaching style that

exhibited educational effectiveness. Therefore, we speculated that nursing practice would improve through self-evaluation of individual nursing practice and incorporation of the results thereof into practice, and that the development of a Self-Evaluation Tool for Evaluation of Nurse Teaching Styles would be of value. In a previous study⁴, 54 self-evaluation items created from the results of a study of nurse teaching styles¹⁻³ that aimed at identifying teaching styles were validated, and 20 items that might be utilized were identified. (Table 1)

The purpose of this study is two-fold. The first purpose is to clarify teaching techniques employed by nurses involved in diabetes patient education, and to verify the hypothetical classification of nurse teaching styles through self-evaluation of awareness and behaviors that differentiate teaching characteristics. The second purpose is to establish

Table 1. Twenty items of the self-evaluation tool for evaluation of nurse teaching styles in diabetes education for which validity was confirmed in the primary investigation

a teaching style which provides general knowledge	It cannot be helped even if patient education does not go well because the problem is usually caused by patients.
	It cannot be helped even if patient education does not go well because life at the hospital and at home are totally different.
	I mainly try to follow the manual in teaching basic diabetes knowledge to patients.
	I provide general knowledge on diabetes that as a nurse I feel might be helpful in patients lives rather than asking patients' opinions.
a teaching style which is attached firmly to an understanding of what the patient is feeling	I tell patients to be open about the psychological problems they have.
	I tell patients that my main role is to listen to their psychological problems.
	I understand the feelings of patients living with diabetes that they cannot overcome, and am often stuck at that point.
	I sometimes feel too much empathy with patients living with diabetes, and this causes me to feel saddled with patients.
	I comprehensively evaluate my patient education by checking how much of a trusting relationship I have built with the patient.
	I comprehensively evaluate my patient education by checking the degree to which patients have expressed their feelings to me.
a teaching style which shows an understanding of the realities of patient living conditions and attitudes	I would like to think about what patients should do to make living with diabetes easier, and work together with patients to find answers.
	I would like to find patient advantages and bring out patients' abilities to control diabetes.
	I tell patients that we should work together to find the causes of the problems that prevent them from conducting the treatment activities well.
	I tell patients that we should work together to find ways to live more easily with diabetes.
	I sit together with both the patient and the family and tell the patient's families how the patient feels and listen to how the family feels.
	I deal with patients and their families together, adjusting to each family's situation after an assessment of the dynamic relations within the family, in order to help them to share how patients feel living with diabetes.
	I often feel the changes in patient awareness and behaviors through education.
	I often feel that patients have obtained the strength to move on to a new stage through education.
	I comprehensively evaluate my patient education by checking how much the patient's lifestyle activities have changed.
I comprehensively evaluate my patient education by checking how the patient attaches meaning to treatment activities for diabetes and attempts to incorporate these activities into their lives through changes in the patient's words and actions.	

a self-evaluation tool for evaluation of nurse-teaching styles as a means of intervention in nursing education.

Review of literature

Research attempting to clarify practical knowledge of nurses has been carried out, including the development of a nursing care practice model by Kawaguchi et al.⁸, an analysis of nursing care by skilled nurses by Higashi⁹, outcome index development for diabetes education by Inagaki^{7,10} and clarification of nurse teaching styles by Tasaki et al.^{1-4, 11-13}

In regard to diabetes nursing care, Nonami et al.¹⁴ reported a research examining nursing care for diabetes patients at outpatient departments in 1997. Fujita et al.¹⁵ conducted research on diabetes patient teaching activities conducted by clinical nurses in northern Kyushu in 2000. Suzuki et al.¹⁶ carried out research on the activities of diabetes educators in Shimane Prefecture in 2003. In addition, Tasaki et al.¹² revealed feelings of nurses who are involved in professional diabetes care in Japan nationally. However, there has to date been no nationwide survey carried out to clarify the

characteristics of teaching which focus on the awareness and behaviors of nurses in diabetes patients education.

With regard to self-evaluation for nursing practice, an approach to diabetes nursing care has not yet made its appearance, with the exception of the study we reported previously.

Methods

1. Framework of the concept in this study (Fig.1)

1) Definition of the 3 teaching styles in this study

In this study, we decided to identify the characteristics of nurse teaching style through 3 different styles. A teaching style which does not show an understanding of the realities of patient living conditions and attitudes was classified into 2 styles, which are a teaching style which provides general knowledge and a teaching style which is attached firmly to an understanding of what the patient is feeling, and a teaching style which shows an understanding of the realities of patient living conditions and attitudes was defined as it was. Defining these styles, a teaching style which provides general knowledge is a style of teaching

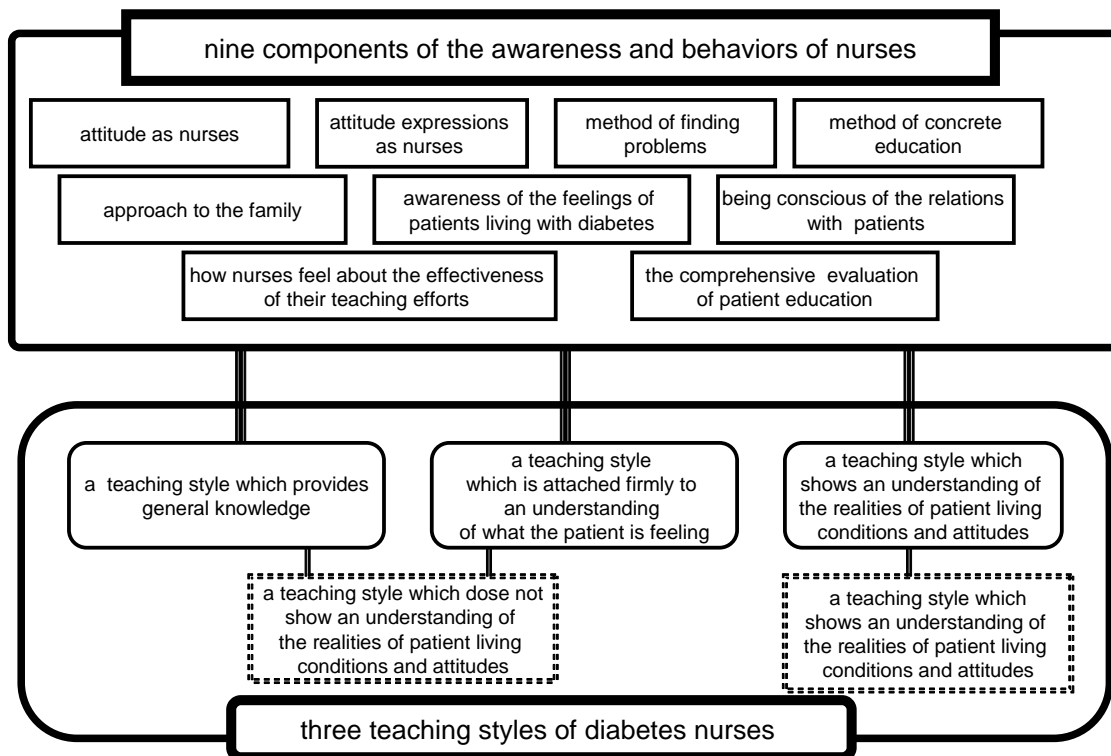


Fig. 1 Framework – Teaching styles and factors of awareness and behaviors of nurses in diabetes education

which is carried out according to nurse initiative and is focused on knowledge. A *teaching style which is attached firmly to an understanding of what the patient is feeling* is a style of teaching that makes the achievement of educational effects difficult because nurses try to adjust to the emotions that patients express but fail to fully understand the essential feelings of patients, resulting in a failure that causes the nurse to lose the initiative in patient care and often ends up in the patient and nurse going round and round in circles. On the other hand, a *teaching style which shows an understanding of the realities of patient living conditions and attitudes* is a style of education by which nurses can care for patients with diabetes by adjusting to the emotions that patients express or that nurses sense even if the patients aren't expressing them, a style that shows the consequent effect of a change in patient awareness and behaviors.

2) Components in the awareness and behaviors of nurses for each teaching style⁴

Nine components in the awareness and behaviors of nurses which are considered essential to effective diabetes educational practice by nurses were chosen. These components are as follows: *Attitude as nurses, Attitude expressions as nurses, Method of finding problems, Method of concrete education, Approach to the family, Awareness of the feelings of patients living with diabetes, Being conscious of the relations with patients, How nurses feel about the effectiveness of their teaching efforts and The comprehensive evaluation of patient education*. Two questionnaire items were created for the nine components for each of the three styles of teaching, which resulted in the creation of a total of 54 questionnaire items. A four-point Likert response scale was used for the 54 items included in this questionnaire from *strongly agree* (four points) to *strongly disagree* (one point).

2. Data collection method

1) Primary investigation

Subjects were nurses involved in diabetes patient education working at facilities authorized

by the Japan Diabetes Society throughout Japan. A total of 2,899 questionnaires were sent to 239 of 464 facilities (51.5%) that had agreed to participate. Facilities were asked only to deliver the questionnaires to individual nurses, and nurses were asked to return the questionnaire responses individually. Participant self-evaluation of their diabetes education style and information on sex, age, the number of years of clinical nursing experience, the number of years involved in diabetes education, certification as diabetes educators of Japan (hereinafter referred to as CDEJ) and attributes such as the location of the facilities at which participants were employed were collected, and General Self-Efficacy Scale (hereinafter referred to as GSES) scores were investigated. The period of investigation was from July to September, 2005. This investigation became the basis for the development of the self-evaluation tool and provided a database indicating the conditions of nurses for this study.

2) Secondary investigation

In order to confirm the identifiability of the characteristics of teaching styles in other groups of nurses involved in diabetes education, we carried out a secondary investigation by utilizing the questionnaires used in the previous study⁴. Subjects were nurses involved in diabetes education at medical facilities in the Hokuriku and surrounding regions. We sent questionnaires to 32 medical facilities that agreed to participate in the study for the number of nurses who were available to participate. The number of questionnaires sent to 3 prefectures in Hokuriku region including Ishikawa, Toyama, and Fukui totaled 534 (84.2%), and those sent to both Niigata and Gifu Prefectures totaled 100 (15.8%). Facilities were asked only to deliver the questionnaires to individual nurses, and nurses were asked to return the questionnaire responses individually or by facility. Items included in the questionnaire were the same as in the primary investigation, and the period of the investigation was from March to June, 2007.

3. Ethical considerations

Approval for this study was obtained from the

Kanazawa University Board of Medical Ethics Review. Participation was anonymous and a matter of individual choice, and the data was handled carefully so as not to identify the facilities or individuals. Return of questionnaires was considered consent for participation in this study.

4. Method of analysis

1) Identification of characteristics of nurse teaching styles

The cluster analysis method utilizing K-means method was chosen for analysis of this investigation. By combining the score distribution for 54 items into 3 clusters and undertaking a relative comparison of scores among 3 clusters, we sought to reveal the characteristics of each cluster. Test of independence was used for the comparison of attributes, one-way ANOVA was used for the comparison of GSES scores, and the Bonferroni method was used for multiple comparisons.

2) Confirmation of validity for the 20 items in self-evaluation tool for evaluation of nurse teaching styles

Factor analysis was used for validity of constructive concept, G-P analysis was used for divergent validity, and GSES score was used for

criterion-related validity. In order to explain the characteristics of teaching styles, principal component analysis was carried out.

For all these data analysis, SPSS Ver.13.0 was used.

Results

In the primary investigation, 1,593 out of 2,899 questionnaires were returned for a collection rate of 54.9%. 1,096 yielded analyzable data and the valid response rate was 68.8%. In the secondary investigation, 527 out of 634 questionnaires were returned for a collection rate of 83.1%. 400 yielded analyzable data and the valid response rate was 75.9%.

1. Background of the respondents

The background of the respondents is shown in Table 2.

2. Teaching styles self-evaluated by nurses in diabetes education

1) Overview

Teaching styles of nurses were classified into 3 clusters. The validity of this result was confirmed by the characteristics of score distribution for 54

Table 2. Attributes of the nurses

Attribute Classification	Primary investigation (n=1096)		Secondary investigation (n=400)		
	Number of respondents (nurses)	Rate (%)	Number of respondents (nurses)	Rate (%)	
Age	21~25	209	19.0	54	13.5
	26~30	289	26.4	76	19.0
	31~35	187	17.1	70	17.5
	36~40	148	13.5	74	18.5
	41~45	118	10.8	58	14.5
	46~50	81	7.4	42	10.5
	51~55	53	4.8	18	4.5
	56~60 (years)	11	1.0	8	2.0
The number of years of clinical nursing experience	<3	147	13.4	43	10.8
	3≤and<5	143	13.1	34	8.5
	5≤and<10	261	23.8	93	23.2
	10≤ (years)	545	49.7	230	57.5
The number of years involved in diabetes education	<3	435	39.7	175	43.8
	3≤and<5	264	24.1	80	20.0
	5≤and<10	285	26.0	93	23.2
	10≤ (years)	112	10.2	52	13.0
Certification as diabetes educators	Certified	312	28.5	95	23.7
	Uncertified	784	71.5	305	76.3

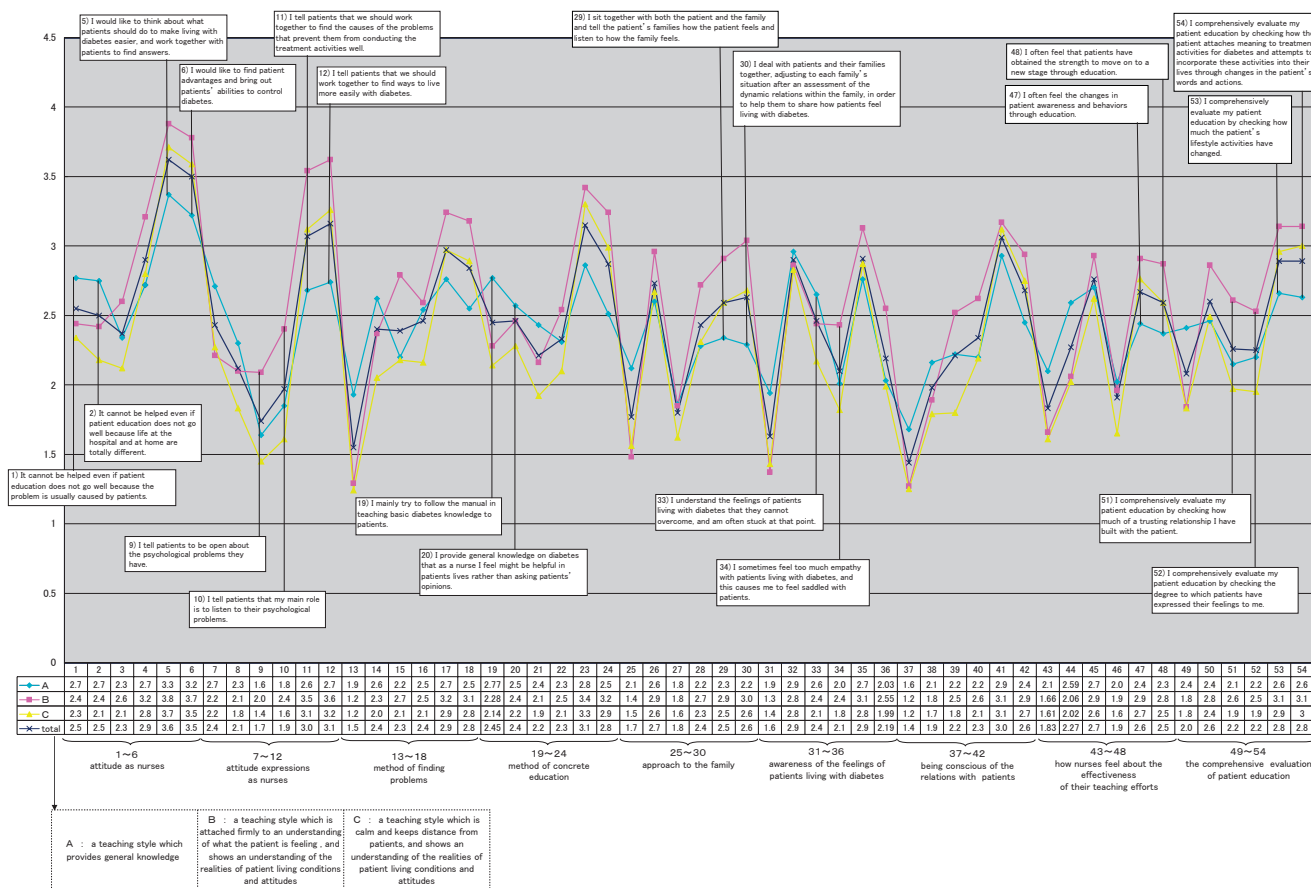


Fig.2 Plot of average scores of 54 items for each teaching style in the primary investigation

items for each cluster and relative comparison of the average scores among these 3 clusters. The clusters were designated as *a teaching style which provides general knowledge, a teaching style which is attached firmly to an understanding of what the patient is feeling, and shows an understanding of the realities of patient living conditions and attitudes, and a teaching style which is calm and keeps distance from patients, and shows an understanding of the realities of patient living conditions and attitudes.* These results are shown in Fig. 2. *A teaching style which provides general knowledge* could be explained as hypothesized; however, the other 2 teaching styles exhibited a mixture of the characteristics of *a teaching style which is attached firmly to an understanding of what the patient is feeling and a teaching style which shows an understanding of the realities of patient living conditions and attitudes.* The largest category, 462 nurses (42.2%) utilized a *teaching style which provides general knowledge*, followed by 360 nurses (32.8%) who

utilized a teaching style which is attached firmly to an understanding of what the patient is feeling, and shows an understanding of the realities of patient living conditions and attitudes, and 274 nurses (25.0%) utilized a teaching style which is calm and keeps distance from patients, and shows an understanding of the realities of patient living conditions and attitudes.

2) Characteristics of 3 teaching styles identified from the investigation of nurses

(1) A teaching style which provides general knowledge

Nurses in this category have a strong tendency to think that the reason why patient education does not work effectively is largely due to patient factors; therefore, they feel they cannot do anything about it. These nurses have low motivation to work with patients. They tend to provide general information along with manuals in a one-way relationship. They do not care much about developing a trusting relationship with patients and often do not attempt to establish one.

These nurses tend to have difficulty in feeling the changes of patient awareness and behaviors through teaching, and low awareness of evaluating teaching comprehensively.

(2) A teaching style which is attached firmly to an understanding of what the patient is feeling, and shows an understanding of the realities of patient living conditions and attitudes

The nurses in this category work on patients very eagerly. However, because they are overeager, they tend to be overly involved in the psychology and emotions of the patient, and sometimes face dilemmas because they feel nothing works well. They perceive changes in patient awareness and behaviors through their teaching and feel when patients are motivated to improve; however, they tend to rely on the trusting relationship with patients even when nothing works well. These nurses have a tendency to evaluate themselves

comprehensively not only focusing on changes in patient awareness and behaviors, but focusing on other all areas highly.

(3) A teaching style which is calm and keeps distance from patients, and shows an understanding of the realities of patient living conditions and attitudes

The nurses in this category do not put energy into patient psychology and emotion so much. They work with patients by keeping distance, and have the lowest tendency to force patients to try hard. They are sufficiently mature and evaluate themselves by focusing on changes in patient awareness and behaviors.

3) Relationship between nurse attributes and teaching styles (Table 3)

(1) Number of years of clinical nursing experience

More than half of the respondents reported 10 years and more of clinical experience. Among

Table 3. Relationship between nurse teaching styles and attributes & GSES scores (n=1096)

Attribute Classification		a teaching style which provides general knowledge	a teaching style which is attached firmly to an understanding of what the patient is feeling , and shows an understanding of the realities of patient living conditions and attitudes	a teaching style which is calm and keeps distance from patients, and shows an understanding of the realities of patient living conditions and attitudes	total
		n (%) 462(42.2)	n (%) 360(32.8)	n (%) 274(25.0)	n (%) 1096(100)
* (1)The number of years of clinical nursing experience	<3	77	35	35	147(13.4)
	3 ≤ and <5	70	36	37	143(13.1)
	5 ≤ and <10	113	72	76	261(23.8)
	10 ≤ (years)	202	217	126	545(49.7)
* The number of years involved in diabetes education	<3	225	105	105	435(39.7)
	3 ≤ and <5	120	84	60	264(24.1)
	5 ≤ and <10	92	113	80	285(26.0)
	10 ≤ (years)	25	58	29	112(10.2)
* Certification as diabetes educators of Japan(CDEJ)	Certified	63	160	89	312(28.5)
	Uncertified	399	200	185	784(71.5)
(4)general self-efficacy scale (GSES)		6.13 ⏟ *	8.01 ⏟ *	8.10	

* p < 0.05

Test of independence was conducted by utilizing χ^2 testing in (1), (2), and (3), and multiple comparison by Bonferroni method was conducted in (4).

these nurses, the rates of *a teaching style which provides general knowledge* and *a teaching style which is attached firmly to an understanding of what the patient is feeling, and shows an understanding of the realities of patient living conditions and attitudes* were almost equal.

(2) Number of years involved in diabetes education

Approximately 40% of respondents reported having been involved in diabetes education for less than 3 years. Among these respondents, those who utilize *a teaching style which provides general knowledge* account for nearly half. More than half of those who had been involved in diabetes education for 10 years and more utilize *a teaching style which is attached firmly to an understanding of what the patient is feeling, and shows an understanding of the realities of patient living conditions and attitudes*.

(3) Nurses who are CDEJ certified

Approximately 30% of all respondents are CDEJ certified, and half of these utilize *a teaching style which is attached firmly to an understanding of what the patient is feeling, and shows an understanding of the realities of patient living conditions and attitudes*. More respondents who are CDEJ certified utilize *a teaching style which is calm and keeps distance from patients, and shows an understanding of the realities of patient living conditions and attitudes* than *a teaching style which provides general knowledge*.

4) Relationship between GSES scores and teaching style

The overall average of GSES scores was 7.24. The average for each teaching style was as follows: *A teaching style which is attached firmly to an understanding of what the patient is feeling, and shows an understanding of the realities of patient living conditions and attitudes* was 8.01, *a teaching style which is calm and keeps distance from patients, and shows an understanding of the realities of patient living conditions and attitudes* was the highest at 8.10, and there was no significant difference between these 2 styles. *A teaching style which provides general knowledge* was 6.13, a significantly lower average score than 2

other styles ($p < 0.05$).

3. Validity of the self-evaluation tool for evaluation of nurse teaching styles in other groups

1) validity of constructive concept (Table 4)

The maximum likelihood method and promax rotation were used for factor analysis. Providing a baseline characteristic value of not less than 1 to determine the number of categories, an analysis was conducted by deleting the items for which factor loading was less than 0.35. Seven factors (18 items) were employed. The accumulative contribution rate by these 7 factors was 52.81%. As shown in Table 4, four factors, namely the first, third, fourth and fifth, consisted of 10 items relating to *a teaching style which shows an understanding of the realities of patient living conditions and attitudes*. The second factor consisted of 4 items relating to *a teaching style which is attached firmly to an understanding of what the patient is feeling*, and 2 factors, namely the sixth and seventh, consisted of 4 items relating to *a teaching style which provides general knowledge*. The validity of 18 out of 20 items (90%) was also proved in the second sampling investigation.

2) Criterion-related validity

There was a weak positive correlation shown as $r = 0.295$ between the subscale scores and general self-efficacy scale (GSES) scores, which indicates a significant correlation ($p < 0.05$) between the two. The subscale scores were arrived at by the addition of the scores of ten items that included the first, third, fourth and fifth factors, all components of *a teaching style which shows an understanding of the realities of patient living conditions and attitudes*, that were more effective in achieving the goals of patient education, in order to check concurrent validity for the 18 items set as the subscale.

3) Examination of reliability

Reliability analysis was conducted for each identified item in three teaching styles by adjusting the subscale items of factors. Cronbach's coefficient alpha for four factors (ten items) belonging to *a teaching style which shows an*

Table 4. Results of factor analysis for self-evaluation tool for evaluation of nurse teaching styles in diabetes education in the secondary investigation

teaching style	the awareness and behaviors of nurses	items	1st factor	2nd factor	3rd factor	4th factor	5th factor	6th factor	7th factor
a teaching style which shows an understanding of the realities of patient living conditions and attitudes	attitude expressions as nurses	I tell patients that we should work together to find ways to live more easily with diabetes.	0.803	0.013	0.030	-0.048	0.119	0.070	-0.034
		I tell patients that we should work together to find the causes of the problems that prevent them from conducting the treatment activities well.	0.755	0.032	0.021	0.027	-0.008	-0.020	0.040
	attitude as nurses	I would like to think about what patients should do to make living with diabetes easier, and work together with patients to find answers.	0.587	-0.109	0.150	0.065	-0.092	0.004	-0.085
		I would like to find patient advantages and bring out patients' abilities to control diabetes.	0.528	-0.022	0.104	-0.031	-0.032	-0.047	-0.052
a teaching style which is attached firmly to an understanding of what the patient is feeling	the comprehensive evaluation of patient education	I comprehensively evaluate my patient education by checking the degree to which patients have expressed their feelings to me.	-0.090	0.754	0.233	-0.028	-0.085	0.040	-0.066
		I comprehensively evaluate my patient education by checking how much of a trusting relationship I have built with the patient.	-0.181	0.704	0.102	-0.008	0.087	0.019	-0.065
	attitude expressions as nurses	I tell patients that my main role is to listen to their psychological problems.	0.293	0.417	-0.193	0.066	0.041	0.031	0.049
		I tell patients to be open about the psychological problems they have.	0.261	0.394	-0.186	-0.031	0.029	-0.064	0.009
a teaching style which shows an understanding of the realities of patient living conditions and attitudes	the comprehensive evaluation of patient education	I comprehensively evaluate my patient education by checking how much the patient's lifestyle activities have changed.	0.097	0.057	0.866	0.014	-0.021	0.055	0.033
		I comprehensively evaluate my patient education by checking how the patient attaches meaning to treatment activities for diabetes and attempts to incorporate these activities into their lives through changes in the patient's words and actions.	0.113	0.003	0.724	0.010	0.049	-0.083	0.050
	how nurses feel about the effectiveness of their teaching efforts	I often feel that patients have obtained the strength to move on to a new stage through education.	-0.046	0.044	-0.048	1.017	-0.007	-0.013	-0.017
		I often feel the changes in patient awareness and behaviors through education.	0.091	-0.059	0.087	0.623	0.008	0.017	0.020
	approach to the family	I deal with patients and their families together, adjusting to each family's situation after an assessment of the dynamic relations within the family, in order to help them to share how patients feel living with diabetes.	0.005	-0.044	0.045	-0.044	1.015	0.014	-0.051
		I sit together with both the patient and the family and tell the patient's families how the patient feels and listen to how the family feels.	0.000	0.130	-0.037	0.068	0.592	-0.019	0.062
a teaching style which provides general knowledge	attitude as nurses	It cannot be helped even if patient education does not go well because life at the hospital and at home are totally different.	0.047	-0.018	-0.040	0.020	-0.028	1.015	-0.037
		It cannot be helped even if patient education does not go well because the problem is usually caused by patients.	-0.082	0.064	0.036	-0.032	0.048	0.413	0.136
	method of concrete education	I provide general knowledge on diabetes that as a nurse I feel might be helpful in patients lives rather than asking patients' opinions.	-0.031	-0.018	0.083	0.039	-0.005	-0.006	0.612
		I mainly try to follow the manual in teaching basic diabetes knowledge to patients.	-0.147	-0.090	0.040	-0.003	0.053	0.081	0.610
Contribution rate of factors (%)			16.29	6.57	4.55	9.42	7.07	4.99	3.90
Accumulative contribution rate of factors (%)			16.29	22.87	27.42	36.85	43.92	48.91	52.81

understanding of the realities of patient living conditions and attitudes was 0.882, which revealed sufficient internal consistency. The coefficient alpha for one factor (four items) belonging to a teaching style which is attached firmly to an understanding of what the patient is feeling was 0.668, which revealed moderate internal consistency. Meanwhile, the coefficient alpha for two factors (four items) belonging to a teaching style which provides general knowledge was slightly low at 0.578; however, it was determined to have a certain level of internal consistency because it was greater than 0.5.

4) Correlation for each identified item of each teaching style

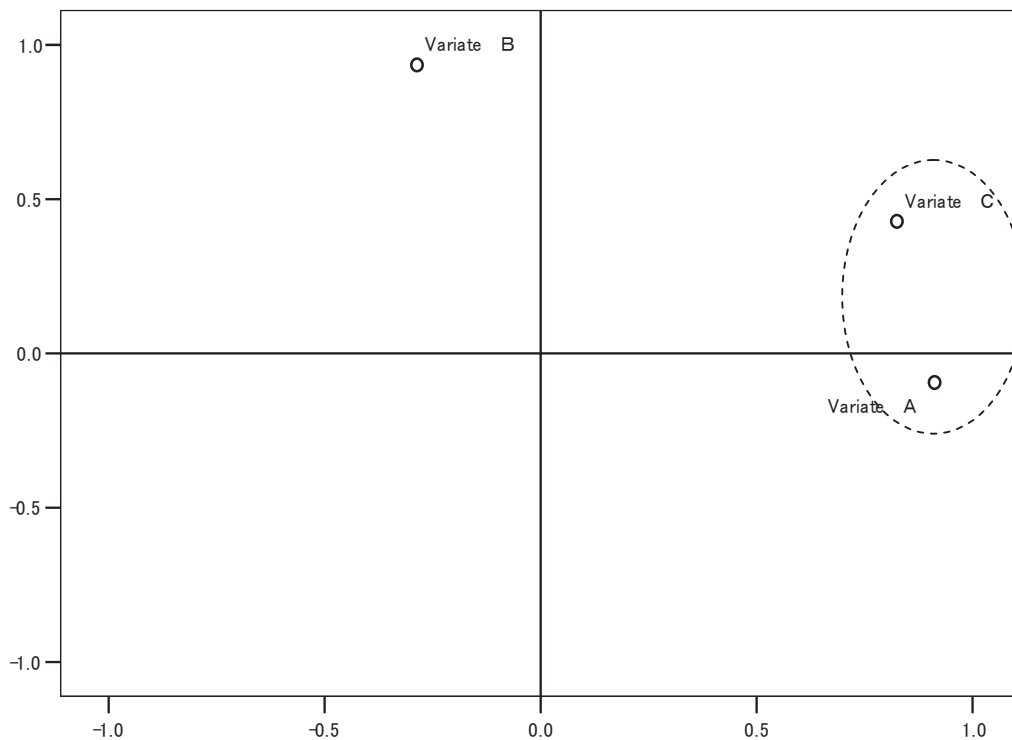
Correlation among identified items of the three teaching styles was investigated. There was a moderate positive correlation ($r=0.457$) between a teaching style which shows an understanding of the realities of patient living conditions and attitudes and a teaching style which is attached firmly to an understanding of what the patient is

feeling. There was a weak negative correlation ($r = -0.226$) between a teaching style which shows an understanding of the realities of patient living conditions and attitudes and a teaching style which provides general knowledge. Both showed significant correlation ($p<0.05$). There was no correlation found between a teaching style which is attached firmly to an understanding of what the patient is feeling and a teaching style which provides general knowledge ($r=0.003$).

5) Explanation by common factors (Fig.3, Table 5)

Seven factors were divided into 3 variates for each identified item of the teaching styles. Scores related to the first, third, fourth and fifth factors became variate A; scores related to the sixth and seventh became variate B; and the score related to the second factor became variate C. Principal-component analysis was conducted for these variates. As a result, two principal components were extracted. The relationship between three variates identifying teaching styles was found in a

Focusing on general knowledge



Focusing on an understanding of the realities of patient living conditions and attitudes

Fig.3 Relationship of variate for teaching style identification in the secondary investigation

Table 5. Principal component analysis results –variate as teaching style identification items in the secondary investigation

Variate	1st principal component	2nd principal component
Variate A scores related to the teaching style which shows an understanding of the realities of patient living conditions and attitudes	0.912	-0.094
Variate B scores related to the teaching style which provides knowledge	-0.286	0.935
Variate C scores related to the teaching style which is attached firmly to an understanding of what the patient is feeling	0.825	0.428
Contribution rate of principal component (%)	53.129	35.553
Accumulative contribution rate of principal component (%)	53.129	88.683

component plot (Fig.3) two-dimensionally; and from the plot, it was interpreted that the first principal component was the degree of *focusing on an understanding of the realities of patient living conditions and attitudes*, and that the second was the degree of *focusing on general knowledge*. The contribution rate of the first principal component was 53.12%, and the accumulative contribution rate of up to the second principal component was 88.68%; therefore, it was believed that these two principal components explained about 90% of the variation (Table 5).

Discussion

1. Identifying characteristics of teaching in actual practice by self-evaluation from the viewpoint of nurse teaching styles

According to the results of this study, teaching styles employed by nurses involved in diabetes patient education were identified by two contrasting characteristics; namely, *focusing on general knowledge* and *focusing on an understanding of the realities of patient living conditions and attitudes*. This matches with the fact that, in the qualitative study, nurse teaching styles in diabetes patient education were classified into two categories; namely, *a teaching style which does not show an*

understanding of the realities of patient living conditions and attitudes and *a teaching style which shows an understanding of the realities of patient living conditions and attitudes*. However, *a teaching style which is attached firmly to an understanding of what the patient is feeling* was mixed with *a teaching style which shows an understanding of the realities of patient living conditions and attitudes* according to the degree of the characteristics that nurses have. This can be explained by the fact that both *a teaching style which is attached firmly to an understanding of what the patient is feeling*, and *shows an understanding of the realities of patient living conditions and attitudes* and *a teaching style which is calm and keeps distance from patients*, and *shows an understanding of the realities of patient living conditions and attitudes* have mixed characteristics of *a teaching style which shows an understanding of the realities of patient living conditions and attitudes* and *a teaching style which is attached firmly to an understanding of what the patient is feeling*. In other words, *a teaching style which is attached firmly to an understanding of what the patient is feeling*, which was predicted to be difficult to identify, was, in fact, difficult to distinguish clearly from *a teaching style which shows an understanding of the realities of patient living conditions and attitudes*.

It was found that, in *a teaching style which provides general knowledge*, nurses tend to have a small amount of experience in diabetes nursing care and a small number of nurses have CDEJ certification, which means these nurses have a lack of practical knowledge and experience. In addition, the low GSES score¹⁷ (6.13) revealed that these nurses face difficulties in achieving an educational response from patients. In *a teaching style which is attached firmly to an understanding of what the patient is feeling*, and *shows an understanding of the realities of patient living conditions and attitudes* and *a teaching style which is calm and keeps distance from patients*, and *shows an understanding of the realities of patient living conditions and attitudes*, the average GSES scores

between 8.0 and 9.0 in the normal category¹⁷ indicated that these nurses can achieve an educational response from patients to some extent. In consideration of the above, the teaching style evaluated by nurses involved in diabetes education can be explained by two characteristics, which are *a teaching style which provides general knowledge*, and *a teaching style which shows an understanding of the realities of patient living conditions and attitudes*.

And from the above, we believe that the teaching conditions of nurses involved in diabetes education in Japan were clarified from the viewpoint of nurse teaching styles.

2. Consideration and future tasks regarding the 18 items for which validity for use in the self-evaluation tool was confirmed

In nursing care, understanding the psychology and emotions of the patient is the care, and it is generally said that such an attitude deepens the trusting relationship between the patient and the nurse. In current basic nursing education, careful listening, empathy, and acceptance are considered as important as a basis of nursing care, and it is expected that the more the nurse is eagerly involved in nursing care, the more they focus on the psychology and emotions of the patient¹⁴. However, four factors regarding specialized recognition, judgment, behaviors, and psychology were not included in these 18 items, which showed that it is difficult to distinguish care by firm attachment to the psychology of the patient and care by evaluating the realities of patient living conditions and attitude. There is a need to reevaluate these items in the future. In addition, according to the results of a previous qualitative study, *a teaching style which is attached firmly to an understanding of what the patient is feeling* is not a style which is effective in achieving the goals of patient education and by which it is easy for nurses to feel the effectiveness of their teaching efforts; however, we were unable to actually prove this in the present study. This study intends to reveal the actual conditions of nurse teaching styles by self-evaluation. It cannot, however,

evaluate teaching effectiveness objectively. It is necessary to examine methods to confirm teaching effectiveness of each nurse teaching style through evaluation by patients and other medical staff.

3. The role of the self-evaluation tool and the orientation of this study in diabetes nursing care

A means for nurses to look back on their diabetes nursing care and specifically perceive their awareness and behaviors in their own practice from the viewpoint of teaching style was found. Awareness of teaching style promotes awareness of practice and encourages reflection. Awareness promotes self-examination and enables nurses to develop themselves¹⁸. This seems to correspond to the process which Benner¹⁹ refers to of converting practical experience to deep experience. The self-evaluation tool contains such potential to develop the teaching effectiveness of nurses, which, it is hoped, will be utilized for future educational intervention for nurses.

Conclusion

1. Based on a previous study, a nationwide investigation on teaching characteristics examined through self-evaluation by nurses involved in diabetes education was conducted. As a result, nurse teaching styles could be explained through two characteristics, which are *a teaching style which provides general knowledge* and *a teaching style which shows an understanding of the realities of patient living conditions and attitudes*, with the former revealing 42.2% and the latter 57.8%. We believe that the teaching characteristics of nurses involved in diabetes education in Japan were identified from the viewpoint of nurse teaching styles.
2. The validity of the self-evaluation tool for evaluation of the teaching styles of nurses involved in diabetes nursing care was also confirmed in a different group of subjects. A means for nurses to look back on their diabetes nursing care and perceive their awareness and behaviors in their own practice specifically from the viewpoint of teaching style was found. It is

hoped that this tool can be utilized for educational intervention for nurses.

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糖尿病教育における看護師の教育スタイル自己評価ツールの開発 —看護師が自己評価する実践の実態から証明する教育の特徴—

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要 旨

本研究の目的は次の2点である。1点目は、糖尿病教育に携わっている看護師の教育の特徴を識別する意識と行為の要素を看護師に自己評価させることによって、看護師が行っている糖尿病教育の実態を明らかにし、仮説概念である看護師の教育スタイルを立証することである。2点目は、それを通じて「教育スタイル自己評価ツール」を看護師への教育介入の手段として確立することである。全国で糖尿病患者教育を実践している看護師を対象に、アンケート調査を実施した。

1次調査(n=1096)にて、糖尿病教育に携わっている看護師が自己評価する教育スタイルを調査した結果、『一般的知識を提供するスタイル』と『生活心情がみえているスタイル』の2つの特徴から説明された。前者が42.2%、後者が57.8%であった。わが国の糖尿病教育にかかわる看護師の教育の実態から、看護師の教育スタイルの視点が立証された。2次調査(n=400)では、別の被験者集団においても糖尿病教育に携わっている看護師の「教育スタイル自己評価ツール」の妥当性が検証された。看護師が自己の糖尿病看護を振り返り、教育スタイルという視点で自らの実践の意識と行為を具体レベルで把握する手段が見出された。この「教育スタイル自己評価ツール」は、今後、看護師への教育介入での活用が期待される。