

Original Paper

Development of a Fulfillment Sentiment Scale for Pregnant Women — Assessment of Reliability and Validity by Factor Analysis —

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Abstract

This study was designed to construct a fulfillment sentiment scale for pregnant women, and assess its reliability and validity. A preliminary study was done with 14 pregnant women. From the records of interviews with these women, 52 items were selected for a fulfillment sentiment questionnaire after examining validity. Subsequently, 92 primiparas were asked to respond to the questionnaire. Each item had a score ranging from 1 (does not fit at all) to 5 (fits very well). Eliminating items with a low factor load and other inappropriate items, a final fulfillment sentiment scale consisting of 42 items was developed. The scale consists of 26 items related to uplifted and depressed factors of fulfillment sentiment, 11 items related to prospect and goal-oriented factors, and 5 items related to independence and dependence. The α indexes of the first, second and third factors were 0.95, 0.85 and 0.71, respectively. Thus, the reliability of the scale was confirmed.

Introduction

In Japan, the overall birth rate reached a low of 1.39 in 1997. Pregnancy and childbirth have become singular experiences for women. The environment surrounding mothers has become diverse in recent years with increasing numbers of nuclear families and working women.

Many studies have characterized the feelings and attitudes toward motherhood and the maternal role among Japanese mothers. But, most previous studies on the awareness and emotions of mothers have focused on the perinatal stage. This is because these studies were based on the assumption that maternal attitudes start to develop during the period of pregnancy and giving birth. Longitudinal studies which have been conducted focusing on pregnancy through the postnatal stage in Japan, consistently recognize the mothers' strong desire for having the child and the positive emotions towards him/her [1][2]. Conversely, these studies have made it clear that some mothers did not have positive feelings towards their pregnancy and giving birth. Aoki [3] and Makino [4] have explained that the mother's awareness of child-rearing is deeply related to her relationship with her child as well as the sense of fulfillment of her life. In the case of dissatisfied mothers, there are presumably problems in relations with other people and lack of self-confidence as a mother or a woman. This appears to be an important point.

These studies point out the importance of clarifying the mother's psychological state in terms of her

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relationship with the child. However, they have so far measured the sense of fulfillment through only one item worded as follows: "I feel a sense of fulfillment as a mother." Also, the subjects of these studies were mothers raising children. In reality, women begin to become mothers, both physically and psychologically, when they become pregnant; therefore, the period of pregnancy is considered vital for the formation of their identities as mothers. It is thus necessary to understand that maternity develops during pregnancy and changes over time.

In this study, a scale was formulated for examining and measuring the sense of fulfillment of pregnant women while keeping in mind the points explained above. In general, fulfillment sentiment encompasses a wide spectrum, ranging from fulfillment sentiment in daily life to that associated with extension and uplift of self. In this study, fulfillment sentiment is defined as the realization of a healthy self-identity.

I Preliminary study

Initially, a preliminary study was done with 14 pregnant women to collect data necessary to prepare a fulfillment sentiment questionnaire.

Methods

Subjects: The subjects of the preliminary study were 14 primiparas visiting the maternity clinic of J University Hospital in Chiba Prefecture. The 14 subjects were in gestation periods of 10-37 weeks. Their ages ranged between 24 and 35 yrs.. Three subjects were in the first trimester, 6 subjects were in the second trimester and 5 subjects were in the third trimester of pregnancy.

Questionnaire: Each subject was asked to fill out a questionnaire to assess how they felt. The questionnaire consisted of 11 items that explored the subject's feelings about her pregnancy. The subject was asked to rate each item on a 5-point scale ranging from no feeling (1-point) to "feel very well" (5-points). The questionnaire was used in the initial portion of the interview.

Interview: The questions for the interview included the following: "What were your feelings as you were answering the questionnaire?" and "What do you think and feel about yourself in daily life?"

Procedures: All subjects gave their informed consents. Each subject was interviewed after a regular physical examination for pregnancy. First, the subjects were asked to fill out the questionnaire, and then interviewed. Filling out the questionnaire and doing the interview took approximately one hr..

This preliminary study was carried out in July and August, 1996.

Results and Discussion

Sentiment about pregnancy: The most frequent sentiment of the 14 primiparas was "happy" (score, mean \pm SD; 4.43 ± 0.62). The next most frequent sentiment was "glad" (4.36 ± 0.81), followed by "satisfied", "established", "fulfilled", "worth doing", "pleasant" and "comfortable", in decreasing order. The items which had a low mean score were "suffering" (2.14 ± 0.83) and "burdensome" (2.43 ± 1.12). The item with an intermediate mean score was "uneasy" (3.00 ± 1.13). For each sentiment, the scores of the women in the three different stages of pregnancy were compared using one-way layout of variance. The scores of the three groups did not differ significantly ($p < 0.05$) in any of the sentiments.

With respect to emotional expression, Russell [5] stated that various emotions can be defined by the two-dimensional combination of pleasure-displeasure and arousal level. Using this theory, "happy", "satisfied", "fulfilled", "worth-doing" and "comfortable" are in the quadrant of the combination of pleasure and low

arousal level. Likewise, “happy” is a positive emotion based on pleasure. It is relevant to assess the frequency of experience and intensity, and its cognitive aspect is related to the sentiment of satisfaction and fulfillment. On the contrary, “suffering” and “uneasy” are negative emotions based on displeasure combined with a high arousal level. In the present preliminary study, the sentiments with a high mean score were related to affirmative images based on positive emotions, while those with a low mean score were related to negative images based on negative emotions. These observations illustrate that the subjects used in collecting the data for the development of the Fulfillment Scale, had the characteristic sentiment of a positive image.

Preparation of the preliminary Fulfillment Sentiment Scale for Pregnant Women: From the Interviews with the pregnant women, 35 items were selected to be used in the preliminary Fulfillment Sentiment questionnaire.

With the assistance of 3 specialists in maternity nursing, two of which had experienced childbirth themselves, the items for a preliminary scale were selected. Consulting research items included in the studies of Ohinata[2], Aoki, et al.[3], the Japanese version of the PIL (purpose-in-life test) of Okado [6], and the fulfillment scale of Ohno [7], the data collected from the interviews were classified into 13 categories and 52 items (Table 1). The preliminary Fulfillment Sentiment Scale for Pregnant Women was developed using terminologies that are appropriate for ordinary people and phrasing the items as simply as possible. A comparison of the items with those on scales selected by 3 specialists, showed an accordancy rate of 92%. The validity of the present questionnaire appears to be high.

II Main study

The goals of this study were twofold. The first was to develop a Fulfillment Sentiment Scale using data derived from a preliminary study. The second was to examine the reliability and validity of the scale.

Methods

Subjects: Ninety-two primiparas who were clients of the maternity clinic of J University Hospital in Chiba Prefecture, were included in this portion of the study.

Measurement: The questionnaire prepared from the preliminary study was used. The subjects were asked to provide age, educational background, employment status and gestation period. This was followed by the statement, “We would like to ask about your general feelings about yourself in daily life”, and the 52 items of the preliminary Fulfillment Sentiment Scale. They were asked to rate each item on a 5-point scale from 1 (does not apply at all) to 5 (fully applicable).

Procedures: Before the medical examination, the purpose of the study was explained and their participation in the study was requested. An informed consent was obtained from each subject. The subject was asked to fill out the questionnaire while waiting for her medical examination, and they were collected after the medical examination. Each subject required approximately 20 minutes to complete the questionnaire.

This study was carried out during September and October, 1996.

Results

Table 2 is a summary of the characteristics of the 92 subjects. The subjects ranged in age from 22 to 40 yrs. with a mean of 28.7 yrs.. According to the vital population statistics of Japan in 1995, the mean age of mothers giving birth to their first child was 27.5 yrs.. The mean age of the subjects in the present study

Table 1 The items of the preliminary Fulfillment Sentiment Scale for Pregnant Women

categories	No	Items
(1) Fulfillment sentiment in daily life	2	My daily life has a nice degree of tension.
	12	I have pleasure that I feel my life is fulfilling.
	22	I live a life worth living.
	32	I feel that I am living, and I feel pleasure that I am alive.
	42	I am glad that I was born.
(2) Self-confidence	4	I am proud of myself.
	14	I live with confidence.
	24	I have confidence.
	34	I am living independently.
	44	I feel that I am living a valuable life.
(3) Sense of solidarity and mission	6	I have a sense of solidarity with fellows and friends.
	16	I am important to my husband and family.
	28	I believe that I live up to the expectations of my husband and family.
	38	I feel that I have a sense of mission in my daily life.
	46	I am delighted because I am fulfilling my role.
(4) Hopes and goals	10	I have dreams for the future.
	20	I have a purpose worth doing my best.
	30	I have distinct goals.
	40	I have hope for a bright future.
	48	I feel pleasure about the accomplishments in my daily life.
(5) Feelings of emptiness	1	I don't enjoy every day life.
	19	I feel that every day is empty.
	37	I feel empty whatever I do.
(6) Sense of boredom	3	I am bored by everyday life.
	21	I am tired of a simple life.
	39	I am somewhat unsatisfied.
(7) Frustration	5	I feel frustrated that I cannot find what I seek.
	23	I feel frustrated that my way of living differs from my ideal.
	41	I feel tense because I feel that I should change myself.
(8) Feelings of powerlessness	7	I don't know what I should do.
	25	I feel annoyed whatever I do.
	43	I am unwilling to do anything.
(9) Feelings of self-hatred	11	I feel that I can't do anything well.
	29	I hate myself.
	45	I am miserable and unpleasant.
(10) Loneliness	13	I feel lonely because I feel left behind.
	31	I feel that everybody ignores me.
	47	I feel that nobody understands me.
(11) Compromise	15	I don't feel that I should change my lifestyle because that's the way it is.
	33	I don't feel unsatisfied even though I feel bored.
	50	I feel that sometimes I have to be patient.
(12) Independence	8	I feel mentally independent.
	18	I feel that I am independent-minded.
	26	I am able to decide my way in life.
	36	I can be responsible for what I have decided.
	51	I am not discouraged by somewhat difficult situations.
(13) Amae	9	I never thought about my way of life and life in general.
	17	Even if I don't take things seriously, I believe that somehow things will work out.
	27	I give up when I have trouble.
	35	I am too dependent on my husband, parents, brothers and sisters.
	52	I am not influenced by others' opinions when making decisions.

Table 2 Characteristics of the subjects who took the Fulfillment Sentiment Scale for Pregnant Women

			Total (N=92)	
Age			N	%
20 - 24	years		13	14.1 %
25 - 29	years		43	46.7 %
30 - 34	years		31	33.7 %
35 - 39	years		4	4.4 %
40 - 44	years		1	1.1 %
* Mean age: 28.7yrs. (22-40yrs.)				
Educational level			N	%
Junior high school			3	3.3 %
Senior high school			31	33.7 %
Junior College, College			58	63.0 %
Employment			N	%
Full-time house wife			67	72.8 %
Part-and full-time workers			25	27.2 %
Gestation Period			N	%
First trimester (-15wks.)			10	10.9 %
Second trimester (16-27wks.)			31	33.7 %
Third trimester (28wks-)			51	55.4 %

was one year higher than this national mean. The educational level and proportion of full-time housewives among the subjects in the present study were higher than those of the general population. Most of the subjects were in the second or third trimester.

Analysis of the items before factor analysis

After the 92 subjects filled out the Fulfillment Sentiment Scale, the mean scores and standard deviation for each item were calculated. It had been decided beforehand that items with a mean score of less than 1.5 or greater than 4.5, were to be excluded, as it was assumed that the distribution was biased in such cases. However, no item was excluded based on these criteria (Table 3). Excluding analogous items, a correlation matrix of 52 items was drawn up. Pairs of items that had a correlation coefficient greater than 0.70 were excluded. The correlation coefficient of the items, "I feel annoyed whatever I do" and "I am unwilling to do anything", was 0.71. Hence, the former was excluded. Consequently, 51 items were analyzed.

The item with the highest mean score among the 51 items was "I am glad that I was born" (4.25 ± 0.77). The second highest score was for "I am delighted because I am fulfilling my role" (3.82 ± 0.68), followed by "I am able to decide my way of life", "I have hope for a bright future", "I am important for my husband and family", etc. The item with the lowest score was "I feel that nobody understands me" (1.62 ± 0.67). The second lowest score was for "I feel that I am ignored by others" (1.75 ± 0.70).

These results suggest that pregnant women tend to deny loneliness and affirm independence, sense of solidarity, and goal-directed sentiment.

Factor analysis

The HALBAU-4 factor analysis program was used to analyze the answers to the 51 items. Extracting 3 factors with a proper value greater than 2.0, the principal factor method and Varimax rotation were performed. As a result, the following items showed a low factor load and were excluded. 1) "I am proud of myself", with first, second and third factor loads of 0.25, 0.12 and -0.26, respectively; 2) "I don't feel that I should change my lifestyle because that's the way it is", with factor loads of -0.20, -0.19 and -0.02; 3) "Even if I don't take things seriously, I believe that somehow things will work out", with factor loads of 0.10, -0.05 and 0.16; 4) "I don't feel unsatisfied even though I feel bored", with factor loads of -0.06, -0.09 and 0.29, and 5) "I have distinct goals in my daily life", with factor loads of 0.17, 0.29 and 0.03. Forty-six items were retained after the first analysis.

A second factor analysis was carried out under the same conditions as the first. As a result, 2 items were excluded. 1) "I feel that I can't do anything well", was ambiguous because its first, second and third factor loads were 0.38, -0.30 and 0.30, respectively. 2) "I have a purpose worth doing my best", was also excluded because its first and second factor loads were -0.34 and 0.35, respectively. This item expresses the goal-directed aspect of life meaning "worth doing my best". This expression is abstract, and may be interpreted in various ways. In the future, appropriate words with a concrete content must be selected.

A third factor analysis was done on the remaining 44 items. In the end, 42 items with a factor load absolute value more than 0.40, were selected for the Fulfillment Sentiment Scale of Pregnant Women (Table 4).

The following three factors can explain 43.7% of variance and were interpreted as follows.

The first factor consisted of 26 items, with factor load absolute values greater than 0.40, such as "I feel lonely because I feel left behind" and "I feel that every day is empty". Among these, the items with high factor loads were mainly items in the lower portion of the category such as general fulfillment sentiment, emptiness, impatience, powerlessness, self-hatred. Emptiness, tedium, impatience, powerlessness, and self-hatred collectively constitute a group of negative sentiments. Fulfillment sentiment was at one pole and these negative sentiments were at the opposite pole. Therefore, this factor was called the "Uplifted and depressed factor of fulfillment sentiment".

The second factor consisted of 11 items, also with factor load absolute values greater than 0.40, such as "I am able to decide my way in life", "I have hope for a bright future" and "I have dreams for the future". Items having high load absolute values were included in the lower portion of the hopes and goals category, consisting of hope, dream, way of life and goal. This factor is associated with fulfillment that is the result of having a goal, good prospects for ones own life, and an intention to realize them. Therefore, this factor was called the "Prospect and goal-oriented factor".

The third factor consisted of 5 items, again with factor load absolute values greater than 0.40, such as "I am too dependent on my husband, parents, etc." and "I tend to depend on others when I am in trouble". This factor includes items in the lower portion of the independence and dependence category. Therefore, this factor was called the "Independence and dependence factor".

Correlation between factors (scales)

The First factor showed a positive correlation to the second factor at 0.36 ($p < 0.05$) and no significant correlation to the third factor. Also, the second factor was not significantly correlated with the third factor.

Examination of reliability

Using the HALBAU-4 statistics program, the reliability of the Fulfillment Sentiment Scale was tested. An analysis of all 42 items in the Fulfillment Sentiment Scale for Pregnant Women showed that Cronbach's α index for the first, second, and third factors were 0.95, 0.85 and 0.71, respectively. These results suggest

Table 3 Scores on each item of the Fulfillment Sentiment Scale for Pregnant Women*

No	Item	Mean	SD
42	I am glad that I was born.	4.25	0.77
46	I am delighted because I am fulfilling my role.	3.82	0.68
26	I am able to decide my way in life.	3.78	0.74
40	I have hope for a bright future.	3.76	0.65
16	I am important to my husband and family.	3.76	0.74
36	I can be responsible for what I have decided.	3.75	0.64
51	I am not discouraged by somewhat difficult situations.	3.75	0.79
32	I feel that I am living, and I feel pleasure that I am alive.	3.70	0.84
10	I have dreams for the future.	3.66	0.78
44	I feel that I am living a valuable life.	3.47	0.70
12	I have pleasure that I feel my life is fulfilling.	3.42	0.85
30	I have distinct goals.	3.38	0.87
48	I feel pleasure about the accomplishments in my daily life.	3.36	0.77
34	I am living independently.	3.33	0.72
14	I live with confidence.	3.30	0.73
24	I have confidence.	3.27	0.69
28	I believe that I live up to the expectations of my husband and family.	3.23	0.74
20	I have a purpose worth doing my best.	3.23	0.96
35	I am too dependent on my husband, parents, brothers and sisters.	3.23	1.00
22	I live a life worth living.	3.21	0.76
49	I tend to depend on others when I am in trouble.	3.20	0.91
4	I am proud of myself.	3.17	0.82
2	My daily life has a nice degree of tension.	3.15	0.92
38	I feel that I have a sense of mission in my daily life.	3.06	0.75
8	I feel mentally independent.	3.00	0.86
18	I feel that I am independent-minded.	2.98	0.93
6	I have a sense of solidarity with fellows and friends.	2.96	1.00
15	I don't feel that I should change my lifestyle because that's the way it is.	2.86	0.97
52	I am not influenced by others' opinions when making decisions.	2.74	0.87
39	I am somewhat unsatisfied.	2.69	0.97
33	I don't feel unsatisfied even though I feel bored.	2.65	0.95
41	I feel tense because I feel that I should change myself.	2.65	0.98
21	I am tired of a simple life.	2.63	1.01
17	Even if I don't take things seriously, I believe that somehow things will work out.	2.51	0.81
25	I feel annoyed whatever I do.	2.48	0.92
3	I am bored by everyday life.	2.44	1.09
43	I am unwilling to do anything.	2.32	0.97
7	I don't know what I should do.	2.29	0.92
23	I feel frustrated that my way of living differs from my ideal.	2.23	0.81
45	I am miserable and unpleasant.	2.23	0.91
5	I feel frustrated that I cannot find what I seek.	2.19	0.92
1	I don't enjoy every day life.	2.15	0.91
11	I feel that I can't do anything well.	2.14	0.76
27	I give up when I have trouble.	2.13	0.70
29	I hate myself.	2.13	0.84
50	I feel that sometimes I have to be patient.	2.11	0.80
19	I feel that every day is empty.	2.11	0.89
9	I never thought about my way of life and life in general.	2.07	0.85
13	I feel lonely because I feel left behind.	1.98	0.96
37	I feel empty whatever I do.	1.97	0.85
31	I feel that everybody ignores me.	1.75	0.70
47	I feel that nobody understands me.	1.62	0.67

*The subjects were asked to rate each item on a 5-point scale from 1 (does not apply at all) to 5 (the subject fully agrees). The mean and standard deviation of the scores on each item are shown (n=92)

Table 4 Matrix of factors in the Fulfillment Sentiment Scale for Pregnant Women

Category	No	Item	Factor Load			communality
			Factor1	Factor2	Factor3	
I	13	I feel lonely because I feel left behind.	0.75			0.5521
	19	I feel that every day is empty.	0.75			0.6229
	39	I am somewhat unsatisfied.	0.72			0.5341
	32	I feel that I am living, and I feel pleasure that I am alive.	-0.72			0.6106
	23	I feel frustrated that my way of living differs from my ideal.	0.71			0.5362
	3	I am bored by everyday life.	0.70			0.5239
	43	I am unwilling to do anything.	0.69			0.5644
	1	I don't enjoy every day life.	0.68			0.4468
	21	I am tired of a simple life.	0.67			0.4261
	37	I feel empty whatever I do.	0.66			0.5772
	48	I feel pleasure about the accomplishments in my daily life.	-0.65			0.5831
	12	I have pleasure that I feel my life is fulfilling.	-0.65			0.4685
	29	I hate myself.	0.64			0.5807
	45	I am miserable and unpleasant.	0.63			0.5334
	44	I feel that I am living a valuable life.	-0.63			0.4583
	22	I live a life worth living.	-0.62			0.3332
	7	I don't know what I should do.	0.60			0.4711
	24	I have confidence.	-0.57			0.4758
	41	I feel tense because I feel that I should change myself.	0.51			0.3128
	46	I am delighted because I am fulfilling my role.	-0.51			0.4307
	5	I feel frustrated that I cannot find what I seek.	0.49			0.2927
	50	I feel that sometimes I have to be patient.	0.47			0.3746
	42	I am glad that I was born.	-0.47			0.3252
	6	I have a sense of solidarity with fellows and friends.	-0.45			0.2770
	31	I feel that everybody ignores me.	0.43			0.3115
	2	My daily life has a nice degree of tension.	-0.41			0.2055
	II	26	I am able to decide my way in life.		0.69	
40		I have hope for a bright future.		0.66		0.6357
10		I have dreams for the future.		0.61		0.4188
9		I never thought about my way of life and life in general.		-0.58		0.4107
30		I have distinct goals.		0.58		0.5050
16		I am important to my husband and family.		0.52		0.3011
36		I can be responsible for what I have decided.		0.51		0.4307
14		I live with confidence.		0.49		0.3746
51		I am not discouraged by somewhat difficult situations.		0.46		0.3904
52		I am not influenced by others' opinions when making decisions.		-0.45		0.2680
47		I feel that nobody understands me.		-0.42		0.3345
III	35	I am too dependent on my husband, parents, brothers and sisters.				0.5341
	49	I tend to depend on others when I am in trouble.				0.3342
	8	I feel mentally independent.				0.4833
	18	I feel that I am independent-minded.				0.3274
	27	I give up when I have trouble.				0.4626
sum of square of factor loading			11.4	4.6	2.5	
contribution rate(%)			25.5	11.7	6.5	
cumulative contribution rate(%)			25.5	37.2	43.7	

I : Uplifted and depressed factor of fulfillment sentiment

II : Prospect and goal-oriented factor

III : Independence and dependence factor

that the Fulfillment Sentiment Scale for Pregnant Women has a high internal consistency.

Discussion

The Fulfillment Sentiment Scale for Pregnant Women was developed to analyze the structure of the fulfillment sentiments of pregnant women.

Generally speaking, fulfillment sentiment encompasses a wide spectrum, ranging from fulfillment sentiment in daily life to those associated with extension and uplift of self. In the present study, the fulfillment

sentiment of pregnant women was operationally defined as a self-affirmative sentiment felt by pregnant women in the process of integrating a healthy self-identity. Ryo [8] said that: "Identity has ego or self which is an individual reality in the core. Its main theme is how it develops in the process of consistent formation under the influence of changing physical, personal, social, cultural, national, ethnic, political and historical processes". Okamoto [9] identified two characteristics in the development of identity with regard to the life cycle. First, a woman continually shapes and develops her identity throughout her life. This suggests that in pregnancy, childbirth and child-rearing, important individuals such as her husband and child may compel her to divide her previous self into parts. Second, a woman's identity matures and deepens through the establishment of self. At the same time, through personal relationships with others, she recognizes her identity, and becomes mature. This applies to the identity as wife and mother.

Rubin [10] believed that pregnant women pass through the first stage of the acquisition of the mother role. Hertz and Molinski [11] stated that the first pregnancy brings especially large changes in the surrounding environment. With changes in the social status and personal relationships of women, a new goal related to her child is established and consequently, the first pregnancy is well received as it gives fulfillment sentiment and satisfaction, and promotes self-value. Of the 3 factors isolated in the present analysis, the second factor, the prospect and goal-oriented factor, and the third factor, the independence and dependence factor, support this previous study.

However, in the process of developing the present fulfillment sentiment scale, many items were concentrated in the first factor, and relatively few items related to the second and third factors were included. It appears to be necessary to increase the number of items related to the latter two factors in future studies.

Conclusion

The results of the present study are as follows:

1. Based on the result of factor analysis, a Fulfillment Sentiment Scale for Pregnant Women was developed. The items on the questionnaire are related to three factors; 26 items related to the uplifted and depressed factor of fulfillment sentiment, 11 items related to prospect and goal-oriented factor, and 5 items related to independence and dependence factor.
2. The reliability of the Fulfillment Sentiment Scale was examined and Cronbach's α index for the three factors were determined to be 0.95, 0.85 and 0.71, respectively.
3. The validity of the Fulfillment Sentiment Scale was assessed. The items in the scale were selected from evaluations by 3 specialists and the accordance rate of the items in the present study was 92%. The validity of the content was confirmed.

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