Original Article

Validity, reliability, and factor analysis of organoleptic tests of Dangke Deppamil as an alternative treatment of nutrition problems in pregnant women in Indonesia

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Abstract:

BACKGROUND: Dangke is a traditional food product sourced from high-quality cow's milk from Enrekang Regency, South Sulawesi, Indonesia. The nutrients contained in Dangke are a source of calories needed by the body and can help meet the nutritional needs of pregnant women. The present study was conducted to validate the organoleptic instrument of Deppamil Dangke through validity, reliability, and factor analysis; the organoleptic test of Deppamil Dangke was carried out.

MATERIALS AND METHODS: This type of research is a mix method with an explanatory sequential design approach. Qualitative analysis was done using Atlas Ti software.

RESULTS: The results of the instrument validation showed a reliable level of instrument validity with Kaiser–Meyer–Olkin results (0.747), and the Cronbach's coefficient alpha values of each of the two types of Deppamil Dangke were 0.84 and 0.91. Exploratory factor analysis identified two main factors using the varimax rotation and excluded items with a factor loading below 0.3, which included taste (2 items), color (2 items), aroma (2 items), and texture (2 items), which explains 52.7% of the general variance of the Deppamil Dangke organoleptic test. The confirmatory factor analysis results showed that the factor structure of the Deppamil Dangke organoleptic instrument matched the data (CFI = 0.948, TLI = 0.936, RMSEA = 0.069, and WRMSR = 0.891). The factor loading of the model ranged from 0.691 to 0.825 and was statistically significant. The organoleptic test results of the Deppamil Dangke on 30 panelists of pregnant women showed that pregnant women really liked the taste as much as 63.3%, texture as much as 53.3%, and color as much as 50%, and those who really liked the aroma were as much as 46.7%.

CONCLUSION: Recommendation: Deppamil Dangke is liked by pregnant women and is very suitable to be used as an additional food product for pregnant women. It is necessary to make changes and innovations from the Dangke Deppamil product in terms of both texture and appearance and especially in the variety of flavors so that pregnant women can choose flavors according to their wishes and needs.

Keywords:

Deppamil Dangke, nutrition for pregnant women, organoleptic test

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Introduction

Pregnancy is the process of maintaining the fetus in the womb caused by the fertilization of the egg by sperm cells. During pregnancy, there will be physical and hormonal changes that change drastically. The process of pregnancy is a continuous

chain and consists of ovulation, release of the ovum, conception and growth of the zygote, implantation in the uterus, formation of the placenta, and growth and development of the products of conception until maturity/pregnancy.[1]

The fetus needs complete nutrition for growth and development during pregnancy. This nutrition, of course, can only be obtained from what is consumed by pregnant women.[2] However, sometimes, what pregnant women consume without realizing it is still not enough to meet these nutritional needs so that both pregnant women and their fetus are at risk of experiencing malnutrition. Maternal nutritional status before and during pregnancy can affect the growth of the fetus being conceived. The quality of the baby being born is highly dependent on the nutritional state of the mother before and during pregnancy.[3] A pregnant woman will give birth to a healthy baby if her health and nutrition levels are in good condition. But until now, there are still many pregnant women who experience nutritional problems.[4]

Some of the problems of malnutrition in pregnant women that are often experienced include iron deficiency, protein deficiency, folic acid deficiency, calcium deficiency, and iodine deficiency. One of the traditional foods that contain good nutrition for pregnant women is Dangke. Dangke is a traditional local food product typical of Enrekang Regency, South Sulawesi, which is made from quality cow or buffalo milk.[5] The coagulation process of milk protein, papaya latex, and salt produces white Dangke with a soft texture.[6,7] Based on the results of an examination by the Makassar Health Laboratory Center in 2022, Dangke contains iron (Fe) $0.86\ \mu g/g$, calcium $1281.37\ \mu g/g$, carbohydrates 0.74%, and glucose 0.82%,[8] and the results of the study show the value of nutrients of carbohydrates 19.36%, lactadic acid 0.48%, pH 4.8, protein 24.54%, water 44.93%, and fat 8.03%.[9]

The nutrients contained in Dangke are a source of calories needed by the body in the daily intake of Indonesian people[10] and also a variety of foods that can help meet the nutritional needs of pregnant women. Dangke is processed into an additional food product specifically for pregnant women; this product is called "Deppamil Dangke". In the process of making 100 g of Dangke mashed using grated cheese, 1 egg yolk is mixed with 100 g of margarine into the grated Dangke, the mixture is stirred thoroughly using a spatula, 50 g of palm sugar is added, and 4 g of cocoa powder is added. Then the mixture is left until the entire mixture blends well. 175 g of flour is added and then kneaded until the dough is smooth, 20 g of cocochips is mixed in the dough and then stirred again until it becomes a dense dough, the oven is preheated to 150 degrees Celsius for 10 minutes, and the heating system is set up and down.[11]

Organoleptic testing is a test based on sensing processes.[12] Sensing is intended as a physio-psychological process, namely, awareness or recognition of the senses of the properties of objects because of the stimulation received by the senses coming from the object. Sensing can also mean a mental reaction (sensation) if the sensory organs receive stimulation (stimulus). The reaction or impression caused by the stimulus can be in the form of an attitude to approach or stay away, liking or disliking the object that causes the stimulus. Awareness, impressions, and attitudes toward stimuli are psychological reactions or subjective reactions. Measurement of the value/level of impression, awareness, and attitude is called subjective measurement or subjective assessment. It is called a subjective assessment because the results of the assessment or measurement are determined by the actor or the person making the measurement.[12]

The validity and reliability tests on the Deppamil Dangke organoleptic test instrument have never been carried out, so to determine the quality of the Deppamil Dangke organoleptic test instrument, it requires the level of validity and reliability of the instrument to be used.[13] Based on the needs of the Dangke department of organoleptic test instruments, the instrument was tested by measuring validity, reliability, and factor analysis. So, this study describes the results of the instrument validation and organoleptic test of Deppamil Dangke and describes the results of the analysis of the quality of the instrument and the results of the organoleptic test of Deppamil Dangke before being developed for further research in measuring the effectiveness of Deppamil Dangke on birth outcomes in Indonesia.

Materials and Methods

Study design and setting
This research aims to validate the organoleptic instrument of Deppamil Dangke through validity, reliability, and factor analysis; the organoleptic test of Deppamil Dangke is carried out. This type of research is a mix method with an explanatory sequential design approach. The mixed method is research that combines qualitative and quantitative approaches with a specific design to answer research objectives.[14] The explanatory design is a sequential mixed methods design, in which the research process is carried out in two phases. Each phase of the application of quantitative and qualitative methods in explanatory design is carried out at different times. The main purpose of implementing an explanatory design is that data from the results of qualitative methods help explain or build on the results of applying quantitative methods.[15]

Study participants and sampling
Instrument validation was carried out to determine the properties of the Deppamil Dangke organoleptic

instrument on 150 pregnant women who were selected using convenience sampling according to the inclusion criteria: pregnant women who came for a pregnancy check-up, had consent to participate in the study, had the cognitive ability to fill out the questionnaire, did not have mental retardation, and had no history of substance abuse or dependence. Consent forms including information about the aims and methodology of the study were filled out by the participants at the start of the study, and then observation sheets related to data collection were filled in according to their sensory assessment results.

Data collection tool and technique
The data collection instrument was a questionnaire for organoleptic testing on two types of Deppamil Dangke, namely, chocolate flavor and chocolate + ginger flavor in two groups of pregnant women. The Deppamil Dangke organoleptic test instrument was designed to have two items in each of the four organoleptic test sub-scales. The organoleptic test of Deppamil Dangke chocolate flavor and chocolate + ginger flavor each consisted of taste (1 item), color (1 item), aroma (1 item), and texture (1 item). Each item includes a five-point Likers scale. The total score ranges from 8 to 20, with higher scores indicating higher quality of Dangke Deppamil. It takes 15 minutes to complete. This instrument has been tested to construct validity and has been obtained with a value of r = 0.30–0.44 using SEM with Liserel and r = 0.27–0.46 using SPSS. The reliability is also 0.95 using Cronbach's alpha coefficient.[13]

The organoleptic test is a test using the sense of taste to assess the taste of the product, the sense of smell to assess the smell or aroma of the product, the sense of touch to assess the texture of the product, and the sense of sight to assess the color of the product. This test used 30 panelists of pregnant women who were taken by accidental sampling at the Perumnas Antang Makassar Health Center for 2 days, namely, August 15–16, 2022. The results obtained were observed by analyzing the frequency distribution and strengthened by the results of interviews with respondents which were described qualitatively.

Ethical consideration
To comply with the research code of ethics, this research has received approval from the Research Ethics Commission of FKIK Unismuh Makassar with Number 209/UM.PKE/XI/44/2022. Laboratory examination of the products tested met the standards according to the test results report from the Makassar Health Laboratory Center Number 22012733/LHU/BBLK-MKS/V/2022. The results of this research also obtained a copyright from the Ministry of Law and Human Rights Number EC00202241779 on July 4, 2022.

Results

Testing of Dangke Deppamil organoleptic instruments
One hundred and fifty pregnant women with a mean age (standard deviation) of 35 (9.9) filled out the organoleptic questionnaire. 150 (100%) were pregnant women. Regarding the educational status of participants, 27 pregnant women (16.7%) were SD, 20 (13.3%) were SMP, 74 (49%) were SMA, and 31 (20.7%) were at the academic level or had completed tertiary education.

Table 1 shows the mean, standard deviation, skewness, and kurtosis of the total scale and sub-scale of the Deppamil Dangke organoleptic test. All items have skewness and kurtosis values in the range of ±2.0, which confirms that they are normally distributed. The Cronbach value of the Deppamil Dangke organoleptic instrument was 0.841, indicating very good internal reliability. Corrected item-total correlations were all between 0.59 and 0.76 and positive [Table 2].

Content validity
The Deppamil Dangke organoleptic questionnaire was prepared using the backward translation method–forward, first translated into Indonesian and backward translated into Makassar and then translated into Indonesian. Then, content validity was studied by specialists in this field (a nutritionist, a midwife, and a linguist).

Concurrent validity
To determine the factors from the organoleptic test, exploratory factor analysis was used. Prior to performing the analytical method, the Kaiser–Meyer–Olkin (KMO) criteria factors were studied to determine the justification for factor analysis [Table 3]. KMO = 0.747 means the factor correlation is correct; also, Bartlett's KMO test is statistically significant ($P < 0.000$, X2 = 301.732, df = 148). Exploratory factor analysis identified two main factors using the varimax rotation and excluded items with a factor loading below 0.3, which included taste (2 items) color (2 items), aroma (2 items), and texture (2 items), explaining 52,7% of the general variant of the Deppamil Dangke organoleptic test [Table 4].

The CFA results are reported in Table 2 and show that the factor structure of the Deppamil Dangke

Table 1: Mean, SD, Skewness, and Kurtosis of Deppamil Dangke Organoleptic Test Scale

Items	Factor 1	Factor 2	Total scale
Means	29.26	27.34	85.62
SD	9.89	9.27	19.94
Skewness	-0.37	-0.33	-0.49
kurtosis	-0.91	-0.78	-0.38

SD=Standard deviation. Factor 1: Deppamil organoleptic instrument with chocolate flavor. Factor 2: Organoleptic instrument Deppamil chocolate + ginger flavor

Table 2: Measurement of Dangke Deppamil Organoleptic Instruments

Organoleptic Test	Mark	Recommended limit
Internal Consistency (Cronbach's)	0.841	>0.7
Confirmatory Factor Analysis		
X2 (df)	124.34 (148)*	Not significant
Comparative fit index	0.948	>0.9
Tucker–Lewis index	0936	>0.9
Root mean square error of approximation	0.069	<0.08
Weighted root mean square residual	0891	<1.0
Average Variance Extracted	0.59	>0.5
Composite Reliability	0.88	>0.6
Standard error of measurement	2030	The Smaller The Better
Item separation reliability from Rasch	1.00	>0.7
Item separation index from Rasch	55.65	>2
Person separation reliability from Rasch	0.86	>0.7
Person separation index from Rasch	2.43	>2
Test–retest reliability by Pearson correlation	0.87	>0.4

*$P<0.01$

Table 3: Results of the Analysis of KMO and Bartlett's Test and Deppamil Dangke Organoleptic Test

KMO and Bartlett's Test of Sphericity		Value
KMO Measures of Sampling Adequacy.		0.747
Bartlett's Test of Sphericity	approx. Chi-Square	301,732
	df	148
	Sig.	0.000

Data Source: Primary Data from Enrekang District Health Service, Indonesia (2022)

organoleptic instrument fits the data (CFI = 0.948, TLI = 0.936, RMSEA = 0.069, and WRMSR = 0.891). The factor loadings of the models ranged from 0.691 to 0.825 and were statistically significant. The data fit for the Rasch model is acceptable: root mean square standard error (RMSE) = 0.7228. The reliability and item separation indices were 1.0 and 55.65, respectively. In addition, the reliability and people separation indices were 0.86 and 2.43, respectively. AVE and CR were higher than 0.58 and 0.89, respectively, indicating evidence of construct reliability. PCAR results show that the raw variance of FCV-19S explained by the Rasch measure is 61.4%. The unexplained variance in the first contrast is 9.1% (1.64 eigenvalue units). Deppamil Dangke Nutritional Value Content from the laboratory test results as listed in [Table 5] are base recommends Deppamil Dangke as alternative.

complementary foods for pregnant women, especially in Enrekang district, Indonesia. In 100 grams of Deppamil Dangke contains 41.69% carbohydrates with a content of 168 grams, 10.34% protein with a content of 9 grams, and 26.10 fat with a content of 17.5 grams.

The organoleptic test results showed that of the 30 panelists, those who did not like the colors of Deppamil Dangke were 13.3%, those who liked the colors of Deppamil Dangke were 63.3%, and those who really liked the colors of Deppamil Dangke were 23.3%. So, it was concluded that the organoleptic results of the Deppamil Dangke color were favored by pregnant women. Pregnant women who did not like the aroma of Deppamil Dangke were 6.7%, those who liked the aroma of Deppamil Dangke were 63.3%, and those who really liked the aroma of Deppamil Dangke were 30%. So, it was concluded that the organoleptic results of the Deppamil Dangke aroma were favored by pregnant women. Pregnant women who did not like the Deppamil Dangke taste were 6.7%, those who liked the Deppamil Dangke taste were 46.7%, and those who really liked the Deppamil Dangke taste were 46.7%. So, it was concluded that the organoleptic results of the Deppamil Dangke taste were highly favored by pregnant women. Pregnant women who did not like the texture of Deppamil Dangke were 10%, those who liked the texture of 'Deppamil Dangke' were 53.3%, and those who really liked the texture of Deppamil Dangke were 36.7%. So, it was concluded that the organoleptic results of the 'Deppamil Dangke' texture were favored by pregnant women [Table 6].

The results of the qualitative data analysis showed that most of the respondents liked Dangke Deppamil in terms of taste, aroma, color, and texture [Figure 1]. Some also commented after tasting the Dangke Deppamil. Asri's mother stated, "I like the taste and texture, it's just right and tasty". Mrs. Asmi also stated, "The shape is nice, tasty and crunchy, overall I like this cake, I'm sure most pregnant women like this dangke deppamil". Mrs. Intan also stated, "Deppamil dangke is delicious, crunchy and just right sweet".

Based on the results of the interviews, it also provided various views from the participants which became input and improvements to the Dangke department before conducting further research. Mrs. Rina said,
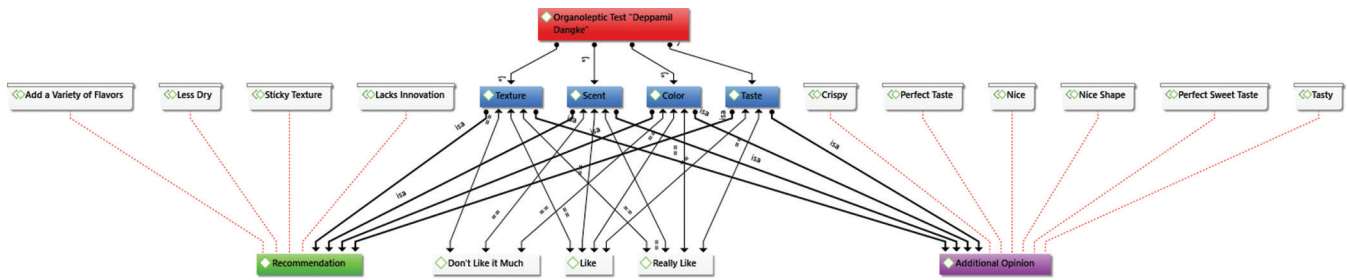
Figure 1: Deppamil Dangke Organoleptic Test Concept Map (Source, Atlas Ti Software). (Arifuddin H, *et al*.: Validity, reliability, and factor analysis of organoleptic tests of Dangke Deppamil as an alternative treatment of nutrition problems in pregnant women in Indonesia)

Table 4: Factor Analysis of Deppamil Dangke Organoleptic Test

Deppamil Dangke organoleptic items	Factor 1	Factor 2	Item Total Correlation
Color Deppamil Brown (X1)	0691		0.59
Aroma Deppamil Chocolate (X2)	0.728		0.69
Deppamil Chocolate Flavor (X3)	0.825		0.74
Deppamil Chocolate Texture (X4)	0.795		0.70
Color Deppamil Brown Ginger (X5)		0.834	0.76
Aroma Deppamil Chocolate Ginger (X6)		0.677	0.56
Deppamil Chocolate Ginger Flavor (X7)		0.797	0.71
Deppamil Chocolate Ginger Texture (X8)		0.816	0.73

Extraction Method: Principal Component Analysis. Data Source: Primary Data from Enrekang District Health Service, Indonesia (2022)

Table 5: Dangke examination results at the BBLM Laboratory in 2022

Parameter (Parameters)	Unit (Units)	Check-up result (Test Results)	Method Specifications (Method Specification)
Smell	-	Normal	Organoleptic
Flavor	-	Typical	Organoleptic
Color	-	Normal	Organoleptic
Fat	%	26,10	Gravimetric
Proteins	%	10.34	Kjehdal
Carbohydrate	%	41.69	Titrimetric
Coarse Fiber	%	0.77	Gravimetric
Glucose	%	46,32	Titrimetric
Vitamin A	µg/g	473,21	Spectrophotometric
Vitamin C	µg/g	294,26	Spectrophotometric
Iron (Fe)	µg/g	22,46	atomization
Calcium (Ca)	µg/g	1202.41	atomization

Data Source: BBLM Laboratory (2022)

"Deppamil dangke tastes really good, it's just that it's not that crunchy and sometimes the texture is sticky to the teeth." Mrs. Risna also said, "The appearance needs new innovations, if necessary the taste is modified". Mrs. Asmi added, "Yes, I think a variety of flavors needs to be added so that pregnant women can choose flavors according to their wishes and needs". From the various opinions above, it will become input for the Dangke Deppamil innovation in the future.

Discussion

The main objective of this study was to evaluate the characteristics of the Deppamil Dangke organoleptic test instrument for the community of pregnant women in Indonesia using classical [i.e., confirmatory factor analysis (CFA)] and modern (i.e., Rasch analysis) test theory evaluation methods. Studies show that the Deppamil Dangke organoleptic test instrument has (i) strong internal consistency (as shown by excellent Cronbach's alpha), (ii) acceptable construct validity (as shown by CFA), (iii) a confirmed unidimensional structure (as shown by CFA and Rasch analysis), (iv) good concurrent validity, and (v) invariant scale items (as shown by Rasch analysis).

Assessing the organoleptic Deppamil Dangke can help assess whether a product is in demand by the population at large. Thus, this information can assist in providing information to certain targeted populations (pregnant women) so that they can carry out preventive behavior through the use of Deppamil Dangke products to help reduce pregnancy problems and produce the desired birth outcomes.

Organoleptic tests determine the taste of food. The taste of food actually consists of three components, namely, smell, taste, and mouth stimulation. The smell of food determines the delicacy of the food. Smell has more to do with the sense of smell. Odors can only be recognized when they are in the form of vapor, and the odor component molecules must have had time to touch the cilia (hair) of the olfactory cells to be transmitted to the brain in the form of electrical impulses by the olfactory endings. Humans are able to detect and distinguish about 16 million types of odors. The sense of smell is independent of sight, hearing, or touch. In general, the odors received by the nose and brain are more of various

Table 6: Deppamil Dangke Organoleptic Test Results

Organoleptic Test		Frequency	Percent	Valid Percent	Cumulative Percent
Color	Do not like it much	4	13.3	13.3	13.3
	Like	19	63.3	63.3	76.7
	Really like	7	23.3	23.3	100.0
Aroma	Do not like it much	2	6.7	6.7	6.7
	Like	19	63.3	63.3	70.0
	Really like	9	30.0	30.0	100.0
Flavor	Do not like it much	2	6.7	6.7	6.7
	Like	14	46.7	46.7	53.3
	Really like	14	46.7	46.7	100.0
Texture	Do not like it much	3	10.0	10.0	10.0
	Like	16	53.3	53.3	63.3
	Really like	11	36.7	36.7	100.0

Source: primary data for 2022

ingredients or a mixture of the four main odors, namely, fragrant, rancid, and charred. It is difficult to explain chemically why compounds cause different odors. The reception of the sense of smell will be reduced by the presence of certain compounds such as formaldehyde. Fatigue of odor can occur quickly.

Taste involves more of the five senses of the tongue. Taste sensing can be divided into four main tastes, namely, salty, sour, sweet, and bitter. The taste of food can be recognized and distinguished by taste buds located on the papillae, which are orange-red stains on the tongue. In addition to the taste component, the component that is also important is the emergence of a person's feelings after ingesting a food. Food ingredients that have properties that stimulate the taste buds under the skin of the face, tongue, or teeth will cause certain feelings, for example, if we eat spices that have a certain impression, such as spicy, hot, or cold. Taste is influenced by several factors, namely, chemical compounds, temperature, concentration, and interactions with other flavor components.

This study agrees with the results obtained from previous Iranian and Italian validation studies[16]; both included depression scales to test concomitant validity and criteria. All three validation studies reported a significant positive association between depression and FCV-19S scores. This is not surprising, but because of the cross-sectional nature of the three studies, it is not clear whether depression increases fear about COVID-19 or whether fear about COVID-19 increases depression (or both). Longitudinal studies are needed to examine the direction of causality.[16] This research is also in line with the research by Kamran *et al*. in 2014[17] that a measuring instrument designed to ensure the attainment of study objectives must be evaluated and tested whether the measuring instrument is valid to use. The study was conducted based on the Health Promotion Model (HPM) to assess the validity and reliability of the hypertension questionnaire which was designed based on the patient's nutritional perceptions with the result

that the questionnaire designed for the assessment of the HPM construct regarding the nutritional problems of hypertensive patients had appropriate psychometric characteristics. The reliability and validity of the questionnaire were also satisfactory, and the overall structure was approved.

Limitation and recommendation
The limitations of this study sample will slightly affect the results of this study; besides that, the use of samples in pregnant women in organoleptic tests is still limited and only in certain populations has not provided results that can be representative of the population as a whole, especially in different geographical conditions.

It is suggested that in order to achieve maximum results, research needs to be developed again on a larger scale by representing populations in different geographical conditions.

Conclusion

The study shows that the Deppamil Dangke organoleptic test instrument has strong internal consistency, acceptable construct validity, good concurrent validity, and invariant scale items so that it can be concluded that the Deppamil Dangke organoleptic test instrument can be used and developed in further research.

Deppamil Dangke is processed from the basic ingredients of Dangke, which are made from cow's milk typical of Enrekang Regency. This product was then tested organoleptic with 30 panelists of pregnant women, so it can be concluded that Deppamil Dangke is liked by pregnant women and based on its nutritional content, it is very suitable to be used as an additional food product for pregnant women. It is necessary to make changes and innovations from the Dangke Deppamil product in terms of texture and appearance and especially in the variety of flavors so that pregnant women can choose flavors according to their wishes and needs.

Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization (WHO). Recommendations on Antenatal Care for a Positive Pregnancy Experience. World Health Organization; 2016. Available from: https://apps.who.int/iris/handle/10665/250796. [Last accessed on 2023 Jan 30].
2. Nur AF, Arifuddin A, Pradana F. The relationship between anemia and the incidence of low birth weight at Anutapura General Hospital, Palu. Healthy Tadulako J (J Kesehatan Tadulako) 2018;4:50-6.
3. Nur AF, Putu Fery Immanuel White I, Trisnaini W, Vidyanto V, Arifuddin A. The effect of chronic energy deficiency (KEK) and emesis gravidarum on anemia in pregnant women. Healthy Tadulako J (J Kesehatan Tadulako) 2020;6:65-72.
4. Naningsi H, Yulita H. The effectiveness of implementing pregnant women class on the improvement of knowledge and attitudes of pregnant women about early detection of high risk pregnancies in the Lalowaru health center of South Konawe district, Sulawesi province. J Res 2019;11:59-75.
5. Masgaba. Dangke: Typical culinary of the Enrekang Community. Walasuji 2021;12:61-75.
6. Sulmiyati S, Said NS. Dangke buffalo milk characteristics with the addition of dried crude papain. Agritech 2019;38:345-52.
7. Zakariah MA, Malaka R, Laga A, Ako A. Isolation and identification of lactic acid bacteria from dangke a white soft traditional cheese from Enrekang Regency. Int J Recent Technol Eng 2019;8:4148-51.
8. BBLK Makassar. Dangke Laboratory Test Results.Pdf. Published online 2022:1.
9. Malaka R, Syabil S, Maruddin F. Physico-chemical properties and microstructure of Dangke cheese by inoculated of lactococcus lactis at different temperature storage. Conf Proc Acad Bus Retail Manag 2017;9:292-8.
10. PMK RI No. 28. Nutrition Adequacy Figures 2019.
11. Minister of Law and Human Rights. Creation Registration Letter. Published online 2022.
12. Semarang Muhammadiyah University. Organoleptic Testing. Published online 2013.
13. Masaeli N, Omranifard V, Maracy M, Kheirabadi G, Khedri A. Validity, reliability and factor analysis of the Persian version of schizophrenia quality of life scale. J Educ Health Promot 2016;5:10.
14. Dawadi S, Shrestha S, Giri RA. Mixed-methods research: A discussion on its types, challenges, and criticisms. J Pract Stud Educ 2021;2:25-36.
15. Creswell JW. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 4th ed. SAGE Publications; 2014.
16. Sakib N, Bhuiyan AKMI, Hossain S, Al Mamun F, Hosen I, Abdullah AH, *et al*. Psychometric validation of the Bangla fear of COVID-19 scale: Confirmatory factor analysis and Rasch analysis. Int J Ment Health Addict 2022;20:2623-34.
17. Kamran A, Azadbakht L, Mahaki B, Sharifirad G. Psychometric testing of an instrument designed to measure nutritional perceptions of hypertensive patients. J Educ Health Promot 2014;3:91.