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RESEARCH ARTICLE

Qualitative Study of Utilization of Local Food for the Nutritional Needs of Stunted Children in Indonesia

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Abstract:

Introduction:

Stunting is a national problem in Indonesia due to an imbalance in children's nutritional intake. Diversity in balanced food consumption is one of the efforts to prevent stunting.

Objectives:

Exploring the potential of various types of food ingredients, utilization, equipment, capabilities, and expectations of the community in utilizing local food to fulfill stunting children's nutrition.

Methods:

Qualitative studies use a phenomenological approach. Research informants 15 people. Data were collected through Focus Group Discussion activities. ATLAS.Ti22 software is used to analyze data from focus group discussions.

Results:

It was found that the theme of ability and expectation has the highest co-occurrence value of 0.76, meaning that hope is very strongly related to the ability of the community. The theme of ability and availability of food ingredients has a co-occurrence value of 0.58, meaning that the ability to process local food ingredients is strongly related to the availability of food ingredients. Utilization and ability co-occurrence value of 0.16 means that the use of local food ingredients is weakly related to the ability to process food.

Conclusion:

Diversity in food consumption is related to food availability, utilization, and ability to process food. Suggestion: local food processing assistance is needed for the stunting target group to increase the community's ability to process local food. Inter-agency collaboration is needed in specific nutrition intervention programs by utilizing local food ingredients.

Keywords: Local food, Child nutrition, Food diversity, Stunting, Food sources, Nutrition interventions.

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1. INTRODUCTION

The problem of malnutrition has an impact on malnutrition, and stunting is still a national problem in Indonesia. Malnutrition is a double burden for developing

countries [1]. Children who experience stunting show growth failure, unresolved malnutrition problems, and food insecurity, which can even be a measure of poverty and poor hygiene [2]. Stunting nationally in North Sumatra Province ranks 17th out of 34 Provinces in Indonesia, with 25.8% of children experiencing stunting based on the results of the 2021 SSGI survey [3].

Stunting does not only occur in Indonesia but almost all over the world. UNICEF reaches 336 million children with stunting prevention and services [4]. In the Ethiopian region, the highest prevalence of stunting is in Northern Ethiopia [5]. The prevalence of acute malnutrition in South African hospitals is 7.2% and shows a significant risk of death [6]. The prevalence of emaciated infants under 5 years in male and female circumcision reaches 80% [7]. Other data states that stunting is high in low-income countries [8]. Previous researchers said data from UNICEF noted that children living in urban areas were less likely to experience stunting than those living in rural areas. Likewise, children who received sufficient iodine consumption had a lower prevalence of stunting than those who consumed less iodine [9].

Nationally, the Indonesian government has set a stunting reduction target of up to 14% in 2024. Therefore, it is necessary to work with all government agencies in the districts and cities of the province to develop an accelerated stunting reduction program based on empirical data. Reducing stunting to prevent long-term impacts. Based on this, conducting an in-depth study of the work program using the situation analysis method in the field is necessary. This stage is the first step to developing program planning according to the needs, capabilities, and existing resources. The pandemic that is prevalent in Indonesia has consequences for increasing poverty rates and the birth of stunted children [10]. Unequal access and distribution of food and decreased purchasing power are the causes of nutritional imbalances for toddlers, children, adolescents, pregnant women, and nursing mothers. Eating behavior causes stunting, malnutrition, and malnutrition. Nutrition interventions and behavior change are important for formulating child nutrition intervention policies [1].

Indonesia's tropical climate and fertile soil are Indonesia's natural wealth potential for a diversity of plants and animals, which also means a wide variety of food and sources of nutrition for the people of Indonesia. Of course, if the Indonesian people in each district and village can take advantage of existing natural resources, then the problem of stunting can be overcome immediately. One of the efforts to prevent food stunting is diverse and balanced, namely that the food consumed is obtained from various types of food that contain carbohydrates, protein, vitamins, and minerals according to age, sex, physiology, body anthropometry, and activities [11].

Each region has different local food advantages. Diversification of local food sources aims to accelerate the consumption of diverse foods and is developed based on community resources and culture [12]. Specific nutrition intervention programs were carried out within 5 years involving cross-sectoral efforts to reduce stunting in Palembang City [13]. These food problems are generally related to the availability of ingredients in one type of food [14]. A food diversification program by managing local food is the right way to maintain food security. Previous research described tubers as a source of vitamins and other nutrients, which are typical plants in Central Kalimantan [15].

Simalungun Regency has an area of 437,250 Ha; the largest area is agricultural land of 84.5% [16]. Based on the description above, this Focus Group Discussion activity is a method used to explore the potential of local food ingredients in Simalungun Regency to fulfill balanced nutrition and prevent stunting. The results of this study are useful for the community to develop food products based on local resources. On the other hand, the results of this study can be used to formulate policies at the village, sub-district, and district levels. The aim of the research: is to explore the potential for various types of foodstuffs, utilization, capabilities, and expectations of the community in utilizing local food to support the nutritional needs of stunted children.

2. METHODS

2.1. Type, Design, and Research Location

Qualitative research was conducted from August to November 2022 in Simalungun Regency using a phenomenological design. The phenomenological design in qualitative research provides a comprehensive natural description of the phenomenon of the research subject to produce meaning and characteristics in the form of a narrative [17]. There are 14 stunting locus villages recorded in Simalungun Regency and spread over 5 sub-districts [18,19].

2.2. Research Participants

Simalungun Regency is the 4th largest district in the Province of North Sumatra, Indonesia, consisting of 32 sub-districts, and the distance between sub-districts is 3-5 hours, so the population is determined by accessible sub-districts and ease of access so 10 stunting locus villages that can be reached are designated as research sites. Inclusion criteria for research participants: 1) the location is a stunting locus village and is accessible. 2) village heads, health cadres, or family companion volunteers 3) willing to be research participants. There were 15 research informants consisting of 7 village heads, 4 health cadres, and 4 family volunteers, so the total number of informants was 15 people. Participants recruited as informants were willing to participate in the research and gave consent through an informed consent form. The next stage provides information on data collection plans and determines the location of the Focus Group Discussion (FGD). This research has received permission from the ethics committee of the “Maluku Husada” High School of Health Sciences number RK. 056/KEPK/STIK/VIII/2022.

2.3. Research Instruments

Data were collected using an instrument in the form of an interview list. The information needed is grouped into 5

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research themes, namely: 1) Types of food ingredients 2) Utilization of food ingredients 3) Equipment 4) Ability to process, and 5) Expectations. The themes were compiled based on previous references [12,14] and then developed by the research team. The research theme is the subject of the questions submitted to the informants. Then the research theme is developed into 1-3 questions submitted to the research participants. The tools used to assist researchers include books, stationery, tape recorders, and cameras for documenting activities used during data collection.

2.4. Data Collection Techniques and Sources

The research was initiated by advocating with the District Government, including the Population Control and Family Planning Service, and the health office down to the District and Village levels. After obtaining permission from the local government, the informant was given an explanation of the research objectives and the information needed to obtain local food information at the research location. Research data was sourced from primary data. Data collection techniques were conducted by interviewing informants through Focus Group Discussion (FGD) activities. Informants were collected at one place according to the agreed time during the initial survey, making it easier for researchers to collect data at one time with a large number of informants. Interviews were conducted face-to-face directly with all informants. Participants are gathered in a 3-star hotel meeting room. The FGD activities lasted for 3 hours. Interviews were conducted face-to-face directly with all informants. Interviews were conducted by research teams 2, 3, 10 and 11, who had Dr, Ph.D. and Masters educational backgrounds, were researchers and lecturers, the sex of the researchers were 3 women and 1 man. The research team has expertise in interviewing and collecting data, and has attended training in qualitative and quantitative research. The research theme was presented, and then asked for opinions from the informants one by one on the themes discussed. The answers from the informants were then asked again for the deep interview technique 2 times to obtain the necessary information and data saturation. The results of the interviews were submitted to informants for clarification and correction.

2.5. Data Analysis

ATLAS.Ti22 software is used to analyze data from Focus Group Discussion results. The use of the software is intended so that the results obtained avoid the subjectivity of researchers. Data validity was carried out by triangulating data sources, namely: cross-checking data from several informants. The stages of analysis are as follows: 1) data from the discussions from the FGD activities are collected in verbatim form. 2) data is labeled based on location (village name). 3) information is inputted in the ATLAS.Ti22 software. 4) input theme and change in coding. 5) read and study all the answers (quotes) in the theme. 6) analyze the theme with a quote. 7) analyze the closeness between themes. The research theme is made into 5 data codes stated in the quote. Themes are identified before the research is conducted. Informants provide feedback on the findings. Research results are displayed in tables and schematics.

3. RESULTS

Demographic data and participant characteristics include village of residence, age, type of work, education, and role in society, as shown in Table **1** below:

Table **1** shows that the research informants came from 10 villages in Simalungun Regency, aged 36-52 years, the majority worked as entrepreneurs 12 people, the education of the majority was junior high school and 8 informants.

Research data collected through focus group discussion activities discussed 5 themes explored with the community in ten stunting locus villages. The 5 themes explored include 1) types of local food ingredients and 2) utilization of local food ingredients by the community. 3) equipment 4) the ability of the community to process local food ingredients and 5) community expectations. The themes and information findings are as follows:

Table 1. Research participant data.

Informant No.	Village	Age	Type of Employment	Education	Role in Society
1	Mekar mulia	42	Self-employed	Bachelor	Village head
2	Mekar mulia	40	Self-employed	Junior High School	Health cadres
3	Baja dolok	46	Self-employed	Senior High School	Village head
4	Baja dolok	38	Self-employed	Junior High School	Health cadres
5	Naga bosar	44	Self-employed	Junior High School	Family support volunteer
6	Bayu bagasan	45	Self-employed	Senior High School	Village head
7	Bayu bagasan	37	Self-employed	Junior High School	Health cadres
8	Ujung meriah	37	Self-employed	Junior High School	Family support volunteer
9	Panembean marjanji	50	Self-employed	Senior High School	Village head
10	Panembean marjanji	36	No job	Junior High School	Health cadres
11	Tanah jawa	52	Civil servant	Bachelor	Village head
12	Tanah jawa	40	Self-employed	Junior High School	Family support volunteer
13	Maligas tongah	47	Self-employed	Senior High School	Village head
14	Dolok panribuan	40	No job	Junior High School	Family support volunteer
15	Marihat raja	45	Self-employed	Senior High School	Village head

Source: primary data, September 2022.

3.1. The Theme of the Types of Local Food Ingredients.

The availability of local food ingredients for each village was stated by informants as follows:

"*In our village, there are Moringa leaves and tor-was-awake leaves" (Informant 1).*

"*In my village, there are lots of noni fruit" (informant 2).*

"*Many food ingredients such as bananas, sweet potatoes, corn, durian, tortoise leaves" (Informant 3).*

"*In our village, there are not many diverse food ingredients, the same as in other villages, food ingredients that are easily available in our village include bananas, sweet potatoes, and corn" (Informant 4).*

"*In our village, the people grow a lot of salak fruit" (Informant 5).*

"*Thank you mom... I conveyed that there are many food ingredients in our village, namely corn and avocado." (Informant 6).*

"*I convey local food ingredients that are easy to find and grow by the community, namely sweet potatoes and bananas" (Informant 7).*

The diversity of types of local foodstuffs in Simalungun Regency, based on informants' statements, found that local food ingredients in several villages had something in common. Mekar Mulia village provides moringa leaves, tor wake-waking leaves, noni Java soil, Marihat Raja bananas, sweet potatoes, durian, tor-was-awake leaves, Bayu Bagasan, food ingredients available in the village such as bananas, sweet potatoes, corn. In March at Raja village, corn and durian are available. Panembean Marjanji Village, salak fruit. Dolok Panribuan Village Corn and avocado. Maligas Tongah village has sweet potatoes and bananas, and almost all villages have sweet potatoes, bananas, and corn.

3.2. The Theme of using Local Food Ingredients

The extraction of available food processing information was stated by informants as follows.

"*So we consume food by boiling and frying, this is the easiest, mom" (Informant 8).*

"*We Labia people like to make sweet potato chips by frying them" (Informant 9).*

"*We process food ingredients by boiling and frying, we also don't know what other foods we want to make" (Informant 10).*

"*We have fried food ingredients ma'am, what kind of food do you want to make? The equipment is also simple because we live in a village, and o one gives suggestions for processing this food" (Informant 11).*

The second theme explored is the use of food ingredients. It is known that the community processes local food by boiling, frying, making chips, and even selling fruits such as snake fruit, avocado, and durian.

3.3. The Theme of Food Processing Equipment

Extracting information on the theme of material processing equipment, supported by several quotes as follows:

"*The equipment we have, tools for boiling, frying, steaming, I convey that we also have tools for making cakes" (Informant 10).*

"*We have cooking tools such as boiling, frying, and baking tools, we also have them" (Informant 11).*

"*In our village, there are tools for cooking stored in the village, usually the family group mobilization team practices making snacks such as cakes, if needed later, they can be used for a demonstration on processing local food ingredients such as brownies from avocado seeds that you mentioned" (Informant 15).*

The equipment available is simple food processing (snacks), such as frying pans and tools for boiling. One of the villages has food processing equipment for making cakes and is inventoried by the village secretary.

3.4. The Ability of the Community to Process Food

This theme was explored by informants because it relates to available food. The information obtained becomes the basis for the government to formulate policies to increase the ability of the community to process local food ingredients.

"*We boil, and we fry ma'am" (informant 13).*

"*We make food such as bananas and sweet potatoes into chips, we fry them with flour and sometimes we boil them. We also dry them in the sun to dry and leave them exposed to rain for up to 1 month, then steam them and eat them with young heads".*

"*We boil and we fry ma'am" (informant 14).*

"*We sell avocados...even if you eat a little, they sell it faster mom. (Informant 10).*

Information on the theme of the community's ability to process food is supported by several quotes: boiled, fried, processed into snacks, not yet able to process it themselves, and ready to provide equipment to process food.

3.5. Community Expectations

This theme is the last theme to be explored so that the community's wishes and the needs they expect can be identified.

"*When asked about expectations, we have a lot of hope, one of which is the government's attention to us regarding the processing of this food so that children do not get bored because if you just boil and fry it every day, children will not eat it" (Informant 2).*

"*My opinion is the same as Mrs. S's. When asked about hope, we have a lot of hope. At least we were taught how to process various kinds of food, for example, as you explained earlier, avocado seeds can be processed into brownies, how do you do that, ma'am? This is interesting ma'am" (Informant 5).*

"*We hope that we will receive attention, assisted by the*

nutritional needs of children. I agree that if you want to be taught how to process food ingredients into cakes, I will be happy to come one day, meaning there is an innovation from mothers. We also hope that you will accompany us to teach you how to make brownies, candies, and other things, ma'am" (Informant 11).

"*When asked about expectations, we have hope that there will be an examination of the content of tor-was-awake leaves, ma'am, so that we know the benefits" (Informant 15).*

Community expectations in food processing to meet the nutritional needs of stunting children are supported by several quotes, including assisted by children's nutritional needs, there are innovations and creations in food processing from students so that children are not bored with the food provided, assistance is needed, there are garden plant innovations, on the other hand, another hope is that the community has an explanation about the content of Tor Bangun Bangun leaves and Noni fruit.

Table **2** shows that the theme of community expectations has the highest closeness with a processing ability of 0.71.It shows that the expectations that people want are related to the abilities they have. Furthermore, the theme of the ability to process food has a close relationship with the availability of ingredients with a co-occurrence value of 0.45, which means that the community's ability to process local food is related to local food availability. The use of local ingredients is closely related to the ability to process a co-occurrence value of 0.39, which means that the community using local food is related to the ability to process food.

After the five themes have been identified, the five themes are assessed for closeness between the themes. The schematic in Fig. (**1**) above shows that utilization is closely related to material availability and expectations. Utilization is related to capabilities and equipment. Equipment has a close relationship with the ability of the community. The availability of materials is closely related to the community's ability and expectations to process local food ingredients. Equipment has a close relationship with capabilities and expectations.

4. DISCUSSION

The results of the identification of local food ingredients in ten villages in Simalungun Regency, namely Bah Kisat Village, Bayu Bagasan Village, Mekar Mulia Village, Baja Dolok Village, Panembean Marjan Village, Maligas Tongah Village, Pardomuan Bandar Village, Ujung Meriah Village, Marihat Raja Village, and Naga Village Bosar, available food ingredients such as cassava and tubers, kapok bananas, corn, snake fruit, avocado, tor tortoise leaves, noni, colorful leaves. The availability of food in Simalungun Regency has similarities with other regions in Indonesia; for example, tor-was-awake leaves are used as medicine for people in Simalungun Regency to improve breastfeeding, respiratory problems, increase immunity and overcome fever. Relevant to previous research, the Central Kalimantan region provides various food plants for medicine for the local community [15].

Table 2. Co-occurrence value.

Tema	Society's Expectations		Processing Ability		Type of Food		Food use		Equipment	
	Count	Coeff.	Count	Coeff.	Count	Coeff.	Count	Coeff.	Count	Coeff.
Society's expectation	0	0,00	12	0,71	3	0,18	6	0,33	3	0,18
Processing ability	12	0,71	0	0,00	3	0,17	7	0,39	5	0,31
Type of food	3	0,18	3	0,17	0	0,00	5	0,45	2	0,20
Food use	6	0,33	7	0,39	5	0,45	0	0,00	4	0,33
Equipment	3	0,18	5	0,31	2	0,20	4	0,33	0	0,00

Source: ATLAS.Ti22 data analysis results.

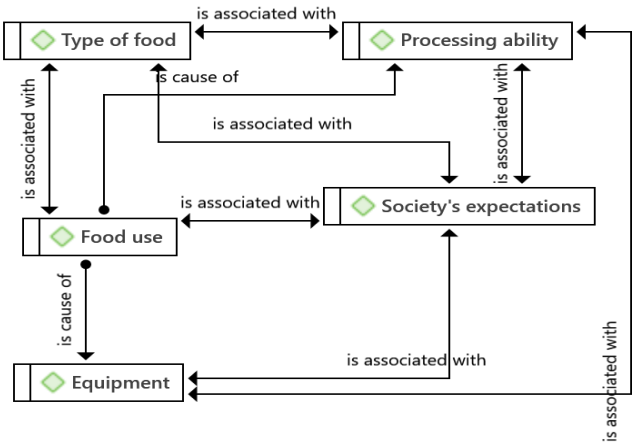

Fig. (1). Local food ingredient identification scheme.

The research findings show that the types of food available in the village, one of which is the leaves of waking up, are processed by boiling. Previous researchers explained that breast milk production increased after consuming the wake-up leaves containing calcium, iron and beta-carotene (Husna, 2021). High iron content can help overcome child stunting in villages. Children living in rural areas are more likely to experience malnutrition than those in urban areas. This is related to the gap in available resources and health policies in rural and urban areas [20].

Types of sweet potatoes and tubers can be used as a source of carbohydrates to replace rice. Relevant to previous research is processing tubers into a source of carbohydrates as a substitute for wheat flour so that dependence on rice can be replaced by local food diversification [14]. So that the composition of the daily diet still contains nutrition that is balanced with the body's needs based on the 4 pillars of balanced nutrition: 1) consuming a variety of foods, 2) implementing clean and healthy living habits. 3) doing physical activity. 4) monitor normal weight. Inadequate food intake and intestinal absorption are factors that cause malnutrition [21].

The prevalence of underweight children in Tigray, Ethiopia, is higher among children in families with low levels of food security. Strategies to increase family food insecurity are a priority for overcoming child nutrition problems [22]. Other researchers explained the results of different studies, further explaining that public health problems related to unbalanced child nutrition, such as stunting, are related to milk consumption and hand-washing habits. Top priorities include personal hygiene practice interventions, milk consumption, family nutrition improvement, and dietary diversity [5].

On the other hand, there are no plant cultivation activities developed for local food crops, which is one of the reasons why the diversity of types of food consumed by the community is not growing. Supported by previous [15] research, the community focused more on farming activities for basic needs and did not cultivate plants as food [23]. This results in the type of food consumed are not diverse. Public health status is affected by the availability and consumption of various foods [24]. Previous research described an integrated model of stunting prevention in children based on community empowerment involving cadres that needed to be carried out to support stunting acceleration programs [25].

The findings show that community expectations are very strongly related to the ability to process local food ingredients. The community does not have the ability to process food in their area into a variety of foods, so that local food potential does not develop. Relevant to previous researchers explaining local food sources available in Balikpapan City, such as sweet corn, pineapple, papaya, jackfruit, bananas, sweet potatoes, cassava, rambutan, and salak. This local food has the potential to be developed into various and quality food products so that it is useful for supporting the economy of the people in Balikpapan City [12].

The closeness between the themes shows that utilization has a close relationship. Material availability, and expectations. It shows that the diversity of materials available in the village is utilized by the community according to their abilities by processing them into snacks, chips, fried, and boiled. Foods that are prepared in a simple and unvaried way result in boredom and boredom for children. A deficiency in protein energy intake is a factor causing stunting, low protein intake is caused by a lack of appetite [26]. Adolescents' iron needs of 11 mg per day can be met by utilizing avocado banana flour processed into brownies. Processed brownies from avocado seed flour and 50%: 70% wheat flour have an iron content of 60.9 mg/kg [27]. Previous researchers explained that the right policy design to reduce stunting in children aged < 5 years can be done through an intervention strategy for women's economic empowerment [5]. One study stated that, specifically in developing countries, child growth is influenced by maternal resources and access to health [28]. Another study states that maternal education is significantly related to stunting [29].

The research results form the basis for compiling a nutritional intervention program for adolescents, pregnant women and toddlers to reduce the prevalence of stunting. Some countries have different interventions. Stunting interventions in Nigeria are focused on improving women's nutrition, child feeding, environmental sanitation and alleviating poverty [30]. The nutritional status of children can be affected by the nutritional status of the mother before pregnancy and during pregnancy [31, 32].

CONCLUSION

Local food ingredients available in the Simalungun Regency area include cassava and tubers, kapok bananas, corn, snake fruit, avocado, tor tortoise leaves, noni, and Moringa leaves. The use of local food ingredients by the community in Simalungun Regency is processed in simple ways such as boiling, frying, and making chips, and even fruits such as salak and avocado, and bananas are sold. Therefore, innovations are needed in processing food so that the diversity of food can be preserved, preventing boredom for people who consume it, such as toddlers, teenagers, pregnant women, and nursing mothers.

The ability of the community to process local food ingredients in Simalungun Regency has a very close relationship with the expectation of the highest co-occurrence value of 0.76 because food processing is carried out simply; the community hopes that there will be innovations in food processing and not cause boredom. The planned innovation is the processing of avocado seeds into brownies that have an iron content of up to 60.9 mg/kg with a ratio of wheat flour and avocado flour of 50%: 70%.

Equipment for processing local food ingredients in Simalungun Regency is closely related to ability. Local food processing is carried out using equipment owned by the community; some villages have cooking utensils from the village managed by the PKK team. The expectations from the community include: helping to meet the nutritional needs of children, there are innovations and creations in food processing so that children do not get bored with the food provided. The results of this study are useful for the community to develop food products based on local resources. On the other hand, the results of this study can be used to formulate policies at the village, sub-district, and district levels.

Local food processing assistance is needed, such as the processing of tor-bangun leaves into cookies, and avocado seeds into brownies so that a variety of foods can arouse children's appetites. It is necessary to involve groups of cadres and family assistants to assist the target group in making plants in the yard to meet the nutritional needs of children, such as planting tor-bangun leaves, cauliflower, chili, and others, to raise fish to meet the protein needs of children. The district government can allocate a budget for the provision of plant and fish seeds for the target group of people.

AUTHORS' CONTRIBUTIONS

Juliandi Harahap: conception and design. Tri Niswati Utami: Analysis and interpretation of data, statistical analysis, and collecting data. Eliska: obtaining funding and collecting data. Zulhaida Lubis: critical revision of the manuscripts for important intellectual content. Rina Amelia: acquistion of data. Delfriana Ayu A and Destanul Aulia: administrative, technical, or material support collecting data. Dina Keumala Sari: statistical analysis. Neni Dwi Aprianti Lubis: supervision. Lita Sri Andayani and Lili Rohmawati: drafting of the manuscript for important intellectual content.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Health Research Ethics Committee of College of Health Science "Maluku Husada" No: RK.056/KEPK/STIK/ VIII/2022.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants of this study.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in google drive at the link [https://rb.gy/0cdp2].

STANDARDS OF REPORTING

COREQ guidelines were followed.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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