

Community Based Survey about Healthy Nutrition Awareness among Saudi Population

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ABSTRACT

Public nutrition education is a corner stone in the nutrition strategy to improve life style and quality of live. This was a cross-sectional survey, carried out on different communities in Saudi Arabia. Total of 1000 participants were selected randomly, the response rate was 95.2%. The participants were Saudis or non-Saudi people from both sexes aged 12 years and above. Results showed that, two third of the participants think their nutrition awareness of healthy diet was good. Almost half of them their source of nutrition information or education was internet & social media and only 11.4% from nutrition clinics. The most frequent topic searched by the participants was obesity and improve fitness. The majority (89.6%) knew the important and recommendation (95.6%) of UNICEF and World Health Organization (WHO) to continue breastfeeding for two years. Most participants (95.4%) knew the complications of increased body weight and obesity and (89.3%) knew the complications of increased blood glucose. Dietary habits assessed by food frequency intake indicated that, almost all participants used to take food from milk and milk group on daily basis and 72.9% they do not take energy drink. The soft drink and fast food intake were part of participant's life style with variable frequencies. There were significant statistical association with food items intake studied especially in relation to gender.

In conclusion, the study population have good nutrition general knowledge, with less optimal dietary habits or practices. Authors recommended to update the food regulations and policies for the use of food rich in vitamins and minerals and low in dense energy, change the dietary habits needs to increase the health education especially through social media.

Keywords: nutrition, resources, education, awareness, dietary habits, Saudi Arabia

INTRODUCTION

Nutrition awareness was defined as self-perception of the importance assigned to eating balanced meals, and classified as high, moderate, or of little importance. Individuals with healthy eating patterns are at lower risk for serious health problems such as heart disease, type 2 diabetes and obesity (Karmali et al., 2020). Optimum nutrition, providing all nutrients in both qualities of nutrients and quantity, is the cornerstone of good health and prevention of diet related diseases. Dietary habit formation is the process by which behaviors become automatic. Habits can form

without a person intending to acquire them, they can also be deliberately cultivated or eliminated (Sinead et al., 2023). There is a growing awareness that nutritional habits may influence risk of several inflammatory and immune-mediated disorders, including autoimmune diseases, through various mechanisms (Ruggeri et al., 2021).

The aims of this study are to evaluate the nutrition knowledge and awareness among the selected participants, explore the topics data usually look for it, identify the resources for nutrition education and to assess their dietary eating habits. Due to alarming obesity

prevalence among Saudis, most recent Saudi study concentrated on nutrition awareness for specific age group such as medical student (Alassaf et al., 2021, Alissa et al., 2015) or dietary habits for specific age 35 – 65 years (Bawazeer et al., 2021) or investigates the changes in dietary habits and lifestyle behaviors among Saudi residents during the COVID-19 pandemic (Bushnaq et al., 2022).

The importance of the study:- . The Saudi health transformation for vision 2030 focuses on prevention and quality of life (strategy) which encourage the health professional to continue studying the trend of dietary habits conjunctly with rapid change in social life. Knew the nutrition knowledge and awareness among Saudi population, identify the resources for nutrition education and assessing their dietary habits. The results and recommendations will help in upgrading and setting or develop initiatives, policies and procedures for healthy eating and healthier lifestyles.

MATERIALS AND METHODS

Study Design

It is a cross-sectional study.

Participants of the Study

A convenient sample of participants were selected randomly from different cities and rural areas of Kingdom of Saudi Arabia. The inclusion criteria were persons aged 12 years or above for both genders.

Table1. Sociodemographic data of the study population

Characteristic	NO (%)
Age (N = 950)	
12-18 years	69 (7.2)
19-29 years	108 (11.3)
30-39 years	330 (34.7)
40-50 years	355 (37.3)
> 50 years	88 (9.2)
Gender (N = 951)	
Male	518 (54.4)
Female	433 (45.5)
Marital status (N = 942)	
Married	527 (56.0)
Single	344 (36.5)
Divorced	71 (7.5)
Education level (N = 938)	
Illiterate	10 (1.1)
Read & write	31 (3.3)
Intermediate	125 (13.1)
Secondary	522 (54.8)
University	192 (20.2)
Postgraduate	58 (6.1)
Occupation (N = 942)	
Student	358 (37.6)
Employed	341 (35.8)
Unemployed	243 (25.5)

Collection of the Data

A self-administered close ended, questionnaire was designed containing socio demographic data, resources of nutrition education, nutrition awareness, and the dietary habits sections. The survey tool was in Arabic, tested (piloted) 25 volunteers for implementation to fulfill the objectives (Lancaster et al., 2004). For food frequency questionnaire we used modified Saudi food frequency questionnaire (Gosadi et al., 2017). A web-based questionnaire was created and utilized for data collection using social media (Whats App application).

Statistical Analysis

Data analyzed using Statistical Package for Social Sciences (SPSS), version 2021. Descriptive analysis was done where frequency and percentage were calculated for all variables, cross tabulation of source of nutrition education and food dietary habit was carried with socio demographic data using Chi Square test, p value less than 0.05 considered significant.

RESULTS

Total of 1000 participants were selected randomly, the response rate was 95.2%. Males constituted almost above half of the participants. Their education of most of them is university educated. The majority were students and employees (Table 1).

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Figure (1) showed that, the majority knew the importance of breastfeeding and think that the duration of breastfeeding was two years, three quarter of the participants' reply that, healthy diet should be from different food items,

delicious, contain all nutrients and contain vegetables. Most of the participant knew the complications of increased body weight and obesity, and the complications of increased blood glucose.

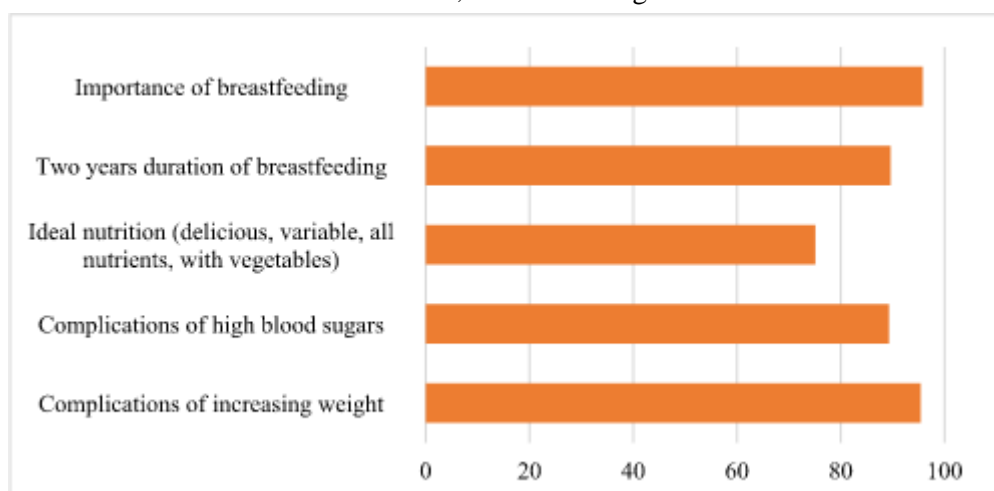


Figure1. Nutrition knowledge of the participants

Almost three quarter of the participants answered that the cause of obesity is multifactorial reasons such as unhealthy

eating, low physical activities and rarely mentioned hormonal imbalance as seen Figure (2).

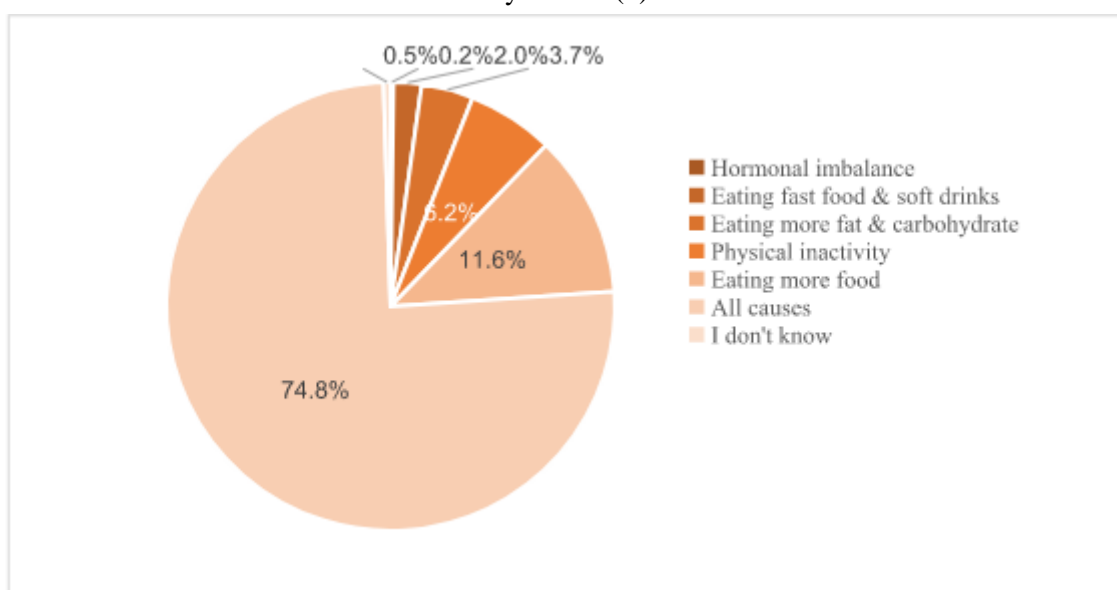


Figure2. The participant's response for cause (s) of obesity

Table2. Participant's nutrition education in relation to level of academic education, Employment and marital status

Variable	N (%)	Education			Occupation				Marital status		
		Secondary or lower	College or higher	P-value	Student	Employed	Unemployed	P-value	Married	Unmarried	P-value
Self-evaluation of nutrition awareness (N = 922)	123 (12.9)	40 (89)	82 (25)	< 0.001	33 (72)	27 (17)	63 (28)	< 0.001	51 (54)	72 (62)	< 0.001
Excellent	117 (12.3)	536	100		230	272	134		383	248	
Very good		23	20		21	10	12		36	7	
Good		639	0		0	0	0		0	0	

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Low Do not know	(67.1) 43 (4.5) 0 (0)										
Source of nutrition education (N = 951)				< 0.001				< 0.001			< 0.001
Internet & social media	464 (48.7)	365 165	95 65		168 95	213 48	80 89		276 138	185 94	1
TV	235 (24.7)	71 40	33 29		43 20	23 41	39 8		51 24	57 41	
Nutrition clinics	108 (11.3)	30 17	18 10		19 13	10 6	19 8		28 10	20 17	
Friends	69 (7.2)										
Newspaper	48 (5.0)										
Books	27 (2.8)										
Frequency of search about nutrition (N = 931)				< 0.001				< 0.001			< 0.001
Daily	153 (16.1)	111 190	42 55		82 96	29 88	42 62		49 155	100 91	1
Weekly	249 (26.2)	225 150	54 97		72 99	162 58	47 91		169 142	111 105	
Monthly	281 (29.5)	0 0	0 0		0 0	0 0	0 0		0 0	0 0	
Rarely	248 (26.1)										
Not at all	0 (0)										
Opinion about sector concerned for nutrition education (N = 941)				< 0.001				< 0.001			0.018
Ministry of Health	165 (17.3)	144 45	18 12		69 17	46 15	47 25		109 29	53 27	
Media	57 (6.0)	26 22	20 0		26 11	9 10	12 1		29 10	18 11	
Saudi FDA	47 (4.9)	447	200		231	261	158		344	302	
Educational institutes	22 (2.3)										
All of the above	650 (68.3)										
Topic of interest for search about nutrition (N = 939)				< 0.001				< 0.001			< 0.001
Obesity	406 (42.6)	319 75	84 58		185 23	134 68	84 44		218 62	183 70	1
Nutrition for children	135 (14.2)	81 96	51 31		67 39	33 41	33 48		91 71	42 56	
Complementary feeding	133 (14.0)	61 18	13 8		43 1	18 6	13 19		33 10	41 16	
Diabetes mellitus	128 (13.4)	22 14	1 0		0 0	22 14	1 0		22 12	1 2	
Diet for sport	74 (7.8)										
Nutrition for elderly	26 (2.7)										
Breastfeeding	23 (2.4)										
Pregnant women	14 (1.5)										

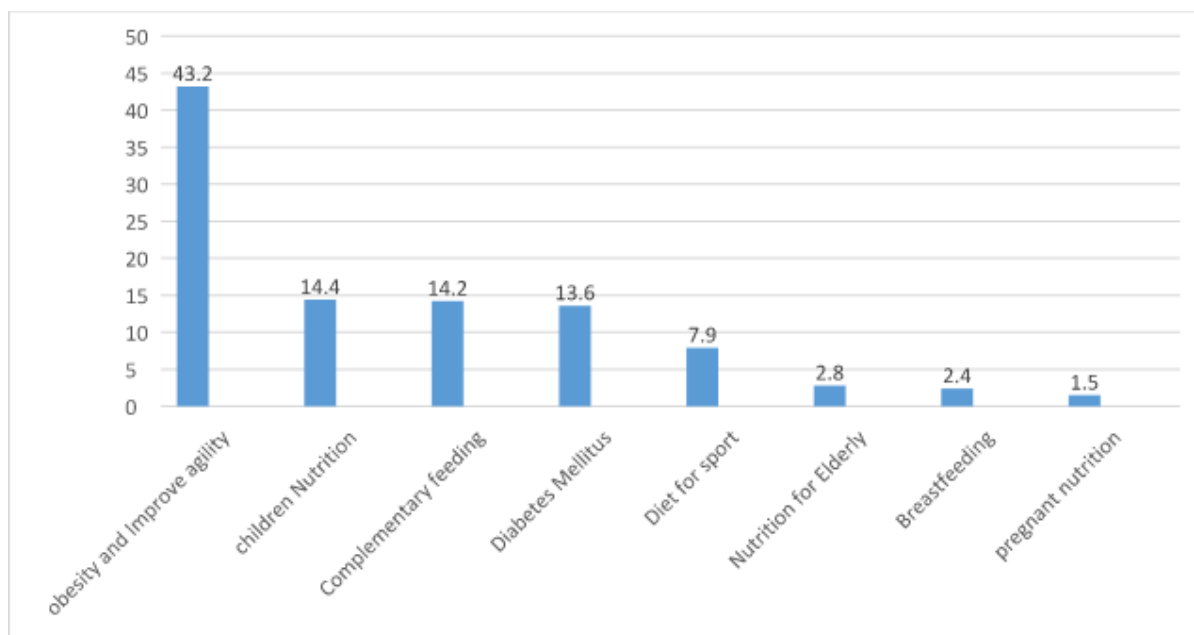


Figure3. Illustrated that, the most topic the participants used to search was obesity or improve agility (fitness). The lowest topics used to search for was and nutrition for elderly.

Food frequency intake of the participants in relation to age and gender explored significant statistical association with food items studied in relation to gender (p value <

0.001), yet , this is not applicable when the correlation assessed per age for intake of laban, yogurt and cooked vegetables (table 3).

Table3. Food frequency intake of the participants in relation to age and gender

Variable	N (%)	Age (years)			Gender		
		< 40	≥ 40	P	Male	Female	P
Milk (N = 938)							
Daily	215 (22.0)	123	92	< 0.001	125	90	< 0.001
Twice weekly	193 (20.3)	93	100		84	109	
Once weekly	170 (17.9)	92	78		90	80	
Once monthly	77 (8.1)	61	16		60	17	
Rarely	194 (20.4)	89	105		114	80	
Never	89 (9.3)	38	51		41	48	
Laban (N = 935)				0.099			< 0.001
Daily	140 (14.7)	71	69	0.788	99	41	< 0.001
Twice weekly	298 (31.3)	170	128		130	168	
Once weekly	333 (35.0)	162	171		186	147	
Once monthly	121 (12.7)	61	60		74	47	
Rarely	27 (2.8)	17	10		12	15	
Never	16 (1.7)	12	4		8	8	
Yogurt (N = 945)				0.788			< 0.001
Daily	160 (16.8)	84	76	0.690	81	79	< 0.001
Twice weekly	458 (48.1)	248	210		248	210	
Once weekly	163 (17.1)	80	83		115	48	
Once monthly	85 (8.9)	44	41		34	51	
Rarely	62 (6.5)	37	25		29	33	
Never	17 (1.8)	9	8		11	6	
Cooked vegetables (N = 942)				0.690			< 0.001
Daily	438 (46.1)	230	209	0.690	271	168	< 0.001
Twice weekly	299 (31.4)	166	133		123	176	
Once weekly	176 (18.5)	88	88		109	67	
Once monthly	28 (2.9)	15	13		15	13	
Rarely	0 (0)	0	0		0	0	
Never	0 (0)	0	0		0	0	

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Fruits (N = 940)				0.021			< 0.001
Daily	400 (42.0)	191	209		206	194	
Twice weekly	262 (27.5)	153	109		126	136	
Once weekly	229 (24.1)	124	105		158	71	
Once monthly	49 (5.1)	31	18		25	24	
Rarely	0 (0)	0	0		0	0	
Never	0 (0)	0	0		0	0	
Soft drinks (N = 943)				< 0.001			< 0.001
Daily	144 (15.1)	115	29		56	88	
Twice weekly	47 (4.9)	23	24		26	21	
Once weekly	150 (15.8)	72	78		89	61	
Once monthly	126 (13.2)	52	74		68	58	
Rarely	275 (28.9)	129	146		175	100	
Never	201 (21.1)	109	92		104	97	
Fast food				< 0.001			< 0.001
Daily	43 (4.5)	39	4		24	19	
Twice weekly	108 (11.3)	66	42		43	65	
Once weekly	189 (19.9)	97	92		124	65	
Once monthly	196 (20.6)	87	109		91	105	
Rarely	345 (36.2)	174	171		196	149	
Never	64 (6.7)	39	25		40	24	
Energy drinks (N = 934)				< 0.001			< 0.001
Daily	69 (7.2)	37	32		41	28	
Twice weekly	46 (4.8)	41	5		5	41	
Once weekly	42 (4.4)	21	21		6	36	
Once monthly	8 (0.8)	6	2		4	4	
Rarely	88 (9.2)	36	52		59	29	
Never	681 (71.5)	356	325		398	283	

DISCUSSION

This survey illustrated information on knowledge and skills in food habits, health education resources utilized by the participants. Overall, the study population has right basic information on diet, and used social media and internet in search, but a viability of data from appropriate resources seems to be limited. Additionally, the dietary habits of food frequencies consumption were mixed habits between healthy and unhealthy foods and had a worrying upward use of energy drinks. The participant's knowledge about importance of breastfeeding and its ideal duration were surprisingly excellent (Figure 1), on other hand, their interest in search in maternal nutrition and breastfeeding are low. Alyousefi had published the importance of social factors in breastfeeding in Saudi population (Nada Alyousefi 2021), which indicate the need for multi-intervention to change the behavior parallel to enrichment of knowledge in breastfeeding.

The majority of participants in this study, knew the complication of obesity and complication of high blood sugar (Figure 1). Improving nutrition knowledge and attitudes through nutrition awareness and education may help to prevent diet related diseases such as obesity, nutritional anemia and heart

diseases (Clark et al., 2021, Hosseini et al., 2019). The prevalence of obesity among Saudi population was 35.5% in 2005 (ALnozha et al., 2005), authors recommended national obesity prevention program at community level to be implemented to promote healthier community. MOH KSA launched obesity prevention program, Saudi dietary Guidelines and others relative programs and policies, the awareness of the participants concerning the risk factors or causes of obesity in this study (Figure 2), concise with the decrease or reduction of obesity prevalence among Saudi population to 20.2% (World Health Survey Saudi Arabia – Final report., 2019). Reviewing the risk factors of overweight and obesity from tens of studies, there were wide variations in the included studies. Authors studied the effect of nutrition education on respond variables, they reported that, the intervention in the forms of nutrition education had a significant effect on nutritional knowledge, attitude and practices among mothers and nutritional status of children less than five years based on the Z-score of body weight for age (Dadang et al., 2015).

Obesity results from consumption of food dense energy than needed by the body, as this energy is stored, fat cells enlarge. Obesity is one of the most common preventable diseases and is a major public health concern. Obesity

has a multifactorial etiology that includes genetic, environmental, socioeconomic, and behavioral or psychological influences (Brambila et al., 2022). In this study (Figure 2) the majority reply that, the cause of obesity is multifactorial risk factors or causes. It is possible to identify increasing number of defects or etiologies that produce obesity, for most patients, however, it is not possible to connect obesity to a specific cause (Bra g., 1999).

Dietary habits are defined as the habitual decisions of individuals or group of people regarding what types and amount of foods they should eat or consume, in other word the choices of the type and quantity of food to be eaten. In our study the participant age <40 years take significantly (P<0.001) more fast food than those aged above 40 year (table 3). Saudi authors reported an association between dietary patterns and socio-demographic factors (Bawazeer te al ., 2021). A Saudi cross-sectional study of 617 healthy adolescents aged 11-18 years, who were recruited randomly from 16 middle and high-schools located in Jeddah and Madinah, Saudi Arabia., 28.5% reported frequent fast-food consumption more than two times a week (Mumena te al., 2022). In Saudi Arabia by telephone call, you can have ordered any type of foods including fast food and soft drink. In this study 15.5 % of the participants taking fast food either daily or twice weekly (Table 3), which is lower than the intake of fast food in America, whereas 55.2% of the adolescents consumed fast food at least one time per day (Lian et al., 2020). In a cross-sectional study, authors found association between availability of neighborhood fast food outlets and overweight among 5- 18 year-old children, (Chee et al., 2019). In systemic review authors found the key individual risk factors with statistically significant associations to overweight and obesity included lack of physical activities reported in six studies and frequent consumption of fast food/junk food

reported in four studies (Mistry and Puthussery., 2015, Salem et al., 2022).

Saudi self-reported questionnaire to assess perceived attitude and barriers to healthy eating habits. Their results indicated that the participants were aware of the importance of healthy eating habits, yet they were not practice healthy food choices in their daily life food habits (Alissa et al., 2015). In this study 20.3 % taking energy drinks either daily or twice weekly (table 3). Energy drink consumption has become a growing public health issue over the past decades (Kaur et al., 2022). Despite claims of being safe and being beneficial, energy drink also associated with fatal outcomes such as ventricular arrhythmias and sudden cardiac death, this depend on the content of the energy drink, the amount of energy drink consumed and the health status of the person. Energy drink that warrants more research and a dire need for age regulations, transparency of ingredients, clear labeling of adverse effects, and most importantly, education of consumers (Amandeep et al., 2022).

The nutrition knowledge of the participants concerning the meaning of healthy diet, duration of breast feeding, were very good or excellent (Figure 1) and causes of obesity (Figure 2). Nutritional knowledge, with education of both the general public, and particularly health professionals is critical if we are to succeed in significantly reducing the excessive premature morbidity and mortality from our leading killer diseases, heart disease, cancer and stroke (Ruojun et al., 2021). MOH, KSA published health and nutrition awareness data, through MOH site at (www.moh.gov.sa (Awareness) and through social media. General directorate of nutrition MOH, KSA supervised training and awareness activities, either attended activities or through distance learning and using social media especially during the outbreak of corona virus COVID 19 (Table 4).

Table4. Training and awareness activities executed by MOH, KSA in the last 3 years

Year	2020	2021	2022	Total
Training activities	198	514	442	1154
Nutrition awareness activities	344	1102	888	2334

Nutrition awareness refers to the understanding the functions and roles of the various nutrients for the human body and the impact of food choices on health status. A randomized controlled trial study compared habit formation (automaticity) for healthy eating behaviors between control and

intervention groups. The intervention group compared to the control group had improved dietary habits by increasing the intake of fruit and vegetables; choosing wholegrain sources over white alternatives, and choosing healthy protein sources over red/processed meat (Sinead et al., 2023).

CONCLUSION

The nutrition awareness is generally good among Saudi population. The dietary habits need to be improved, the intake of fruits should be encouraging and in other side, the intake of energy drink, fast food and soft drink should be reduced by nutrition education, policies, programs and food regulations. The authors recommended the nutritional and health education should be encourage through the social media and through MOH and other relative authorities internet sites and update the food regulations and policies concerning healthy diet.

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LIMITATIONS

It is cross sectional study, however the limitations should be acknowledged. The study were mainly conducted only one thousand of the total population of Saudi Arabia, thus the possibility of recall bias cannot be ruled out.

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