

Dietary Triggers of Irritable Bowel Syndrome: Knowledge and Awareness Assessment

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Abstract

This cross-sectional study aimed to assess individuals' awareness and knowledge of irritable bowel syndrome (IBS) and its dietary management. A total of 410 participants were included, and data was collected using an online survey. The results showed that a significant proportion of participants were aware of the association between IBS flares and diet, with 89.1% of females and 85.6% of males reporting this association. Additionally, 55.4% of females and 68% of males reported having treated or been related to a patient who limited their diet due to IBS. Most participants (81.4% of females and 81.6% of males) felt qualified to advise IBS patients on their diet. However, knowledge regarding specific dietary triggers for IBS symptoms varied, with 47.7% of females and 41.6% of males identifying dairy products as a cause of diarrhea in IBS patients and 43.9% of females and 47.2% of males identifying white bread/rice as a cause of constipation in IBS patients. Regarding dietary management, the majority of participants identified the low FODMAP diet as an appropriate diet for IBS patients. However, knowledge regarding recommended meal frequencies for IBS patients was poor. Only 9 (3.2%) females and 3 (2.4%) males identified the recommended consumption of 1 meal and 3 snacks for IBS patients. The study highlights the need for increased education and awareness among the general population regarding IBS and its dietary management. It is recommended that healthcare professionals provide education and resources for individuals to better manage IBS symptoms through dietary modifications.

Keywords: Irritable bowel syndrome, IBS, Gastrointestinal, KSA

INTRODUCTION

Irritable bowel syndrome (IBS) is regarded as the most common functional bowel illness, characterized by stomach pain with fluctuations in bowel movements and fecal characteristics; most of the IBS admitted cases are predominantly diarrhea irritable bowel syndrome (IBS-D) [1]. Despite the unidentifiable causes of IBS, a few factors have been attributed to its pathogenesis, including genetic elements, dietary consumption, gut microbiota, mild inflammation, and abnormalities of the gastrointestinal (GI) endocrine cells [2]. It is important to note that although the correlation between IBS infliction and certain racial and ethnic groups has been insufficiently researched, medical data has shown that IBS is significantly prevalent among lower socioeconomic communities [3].

IBS can be divided into four primary subtypes, which are diarrhea-based IBS (IBSD), constipation-based IBS (IBSC), mixed bowel habits (IBSM), and a type of unclassified IBS (IBSU) [4]. The primary stage for classification of the various IBS subtypes concerns the differentiation of stool texture and density, for instance, rigid or firm stool or diarrheal stool, of more than 25% of defecation [5]. The Rome IV criteria, along with a thorough analysis of patient medical history, physical examination, and diagnostic procedural tests, can be utilized as a tool for IBS diagnosis [6]. In terms of pharmaceutical

treatments, there have been no definitive drugs directed towards treating IBS. Appropriately, the current treatment targets symptom relief [7].

In terms of prevalence, 7–15% of the general population are inflicted with IBS [8]. This gives rise to a significant number of cases for gastroenterologists, with up to 36% of patient visitations correlated to the syndrome [9].

Notably, in developed countries, IBS is primarily amongst the female population [10]. According to records produced by the University of Gothenburg, most IBS patients correlated

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certain dietary habits to have provoked the infliction of the disease or the deterioration of their state [11]. Clinical data acquired from Alfred Hospital positively reinforces the University of Gothenburg's records that specific food consumption appears to trigger or increase symptoms, such as stomach pain and bloating, for an estimated 60% of IBS patients [12].

Dietary triggers of irritable bowel syndrome have recently been recognized by numerous medical establishments due to the overwhelming published medical research that has shown a positive correlation between dietary consumption and the gravity of symptoms [11]. A conducted study in 2013 deduced that an excessive consumption of spicy food led to an increase in both the occurrence of IBS and the severity of symptoms experienced by IBS patients [13]. Another investigation conducted in 2015 uncovered IBS symptoms are perhaps triggered by the intake of FODMAPs (fermentable oligo-, di-, monosaccharides, and polyols) and insoluble fibers [14]. An additional source conducted in 2021 by Dr. Qiao Meng of Peking University China-Japan Friendship School of Clinical Medicine inferred that higher consumption of dry-fried nuts and soybeans is associated with adverse symptoms in IBS patients [1].

Purpose

In order to be fully equipped to correctly treat patients, it is a physician's obligation to accurately assign patients with appropriate lifestyle changes, which are equally important as medication, before their discharge from the hospital. Such obligations include advising a recently diagnosed lactose-intolerant patient against drinking milk or notifying a patient with hypertension to cut salt. This responsibility is of equal significance as briefing a recently diagnosed Crohn's patient with the knowledge of certain diets that will magnify their affliction. Thus, a physician should be informed about not only which symptoms entail which disease but also how to prevent the deterioration and flare-ups of a disease. Consequently, we were collectively astonished to come upon the impactful and hardening symptoms of IBS that could be triggered by the consumption of certain diets. As we observed upcoming studies exploring dietary factors contributing to IBS flares, it became apparent that knowledge and prophylactic measurements on the topic are sparse. Appropriately, we took it upon ourselves to properly digest which and how certain diets could trigger irritable bowel syndrome patients. our main aim to assess Knowledge and Awareness amongst the IBS medical community towards certain dietary triggers in Saudi Arabia.

MATERIALS AND METHODS

Study Design

A cross-sectional questionnaire was conducted in the period of July 2021- August 2023, directed towards Saudi IBS patients and the medical community.

Participants, Recruitment, and Sampling Procedure

Sample Size

The proposed study was targeted towards the Saudi population consisting of the IBS community and primarily medical students, regardless of whether or not they are inflicted with IBS.

Using the Qualtrics calculator with a confidence level of 95%, an estimated sample size of 385 students was used as a minimum for this study.

Inclusion Criteria and Exclusion Criteria

The proposed study's targeted population consisted of Saudi medical personnel regardless of health status. Using the Qualtrics calculator with a confidence level of 95%, an estimated sample size of 385 students was used for this study. The inclusion criteria were as follows: males and females of any age and private and public medical personnel in the Kingdom of Saudi Arabia. On the other hand, the exclusion criteria were individuals not affiliated with the IBS community and non-medical personnel.

Method for Data Collection and Instrument

A questionnaire was used as a study tool; it was conveyed to the IBS community in Saudi Arabia, and their responses were collected online and anonymously. The questionnaire was composed of 3 sections, each entailed questions, thus a total of 20 questions that varied from multiple choice questions to rating scale questions.

Section 1 included a brief introduction to the following survey and required the participant's consent.

Section 2 inquired about personal data like age, gender, profession, affiliation to IBS and requested information detailing their health status, such as if they are inflicted with irritable bowel syndrome or any other digestive disorder, acquainted with an IBS patient, or as a medical practitioner has had an IBS patient.

Section 3 included questions regarding previous experiences pertaining to how diet can affect IBS symptoms, whether it intensifies or relieves their symptoms, and it will touch on the participant's awareness concerning the matter at hand.

Analysis and Entry Method

Descriptive statistics, including means, standard deviations, and frequencies, were used to describe the demographic characteristics of the participants and their responses to the survey questions. Inferential statistics were used to test the relationships between variables, including chi-square tests and Fisher's exact tests. All statistical analyses were performed using SPSS software (version 26.0, IBM Corp., Armonk, NY, USA), and a p-value less than 0.05 was considered statistically significant.

RESULTS AND DISCUSSION

Table 1 summarizes the demographic characteristics and history of IBS among the 410 participants. The majority of participants were female (69.5%) and aged between 18-24 years (89.3%). Most of the participants were medical students (77.6%). 16.6% of the participants had been diagnosed with IBS, while 61.5% reported being affiliated with someone who has been diagnosed with IBS.

Table 1. Characters of participants and history of IBS (n=410)

Parameter		Frequency (%)
Gender	Female	285 (69.5%)
	Male	125 (30.5%)
Age, y	18 - 21	179 (43.7%)
	22 - 24	187 (45.6%)
	25 or more	44 (10.7%)
	Medical student	318 (77.6%)
Profession	Non-Medical student	20 (4.9%)
	Non-Medical Worker	18 (4.4%)
	Physician	23 (5.6%)
	Student - Biomedical sciences	19 (4.6%)
	Working - Biomedical sciences	12 (2.9%)
Have you been diagnosed with IBS?	No	342 (83.4%)
	Yes	68 (16.6%)
Affiliated with someone who has been diagnosed with IBS	No	158 (38.5%)
	Yes	252 (61.5%)

Table 2 reports the awareness of 410 participants towards IBS. Out of the participants, 88% were aware that IBS flares could be related to diet. Among those who have treated or were related to an IBS patient who limited their diet, 40.7% responded positively. As for qualifying advising an IBS patient on diet, 81.5% of the participants agreed.

In terms of diarrhea-causing foods for IBS patients, 45.9% of the participants identified dairy products, followed by chocolate/caffeine (29.5%). For constipation, white bread/rice was identified by 44.9% of the participants. In terms of appropriate diets for IBS patients, the low FODMAP diet was recognized by 61% of the participants, followed by the vegan diet (20.2%).

Concerning the elimination of dairy and gluten for IBS symptoms, 47.3% of the participants agreed that it could help, while 41.2% were unsure. For recommended consumption, 29.3% of the participants suggested three meals and 2-3 snacks per day, and for non-recommended cooking methods for IBS patients, 76.1% of the participants suggested avoiding frying.

Table 2. Awareness of participants towards IBS (n=410)

Parameter		Frequency (%)
IBS flares related to diet	No	49 (12%)
	Yes	361 (88%)
Treated/related to IBS patients who had limited diet	No	243 (59.3%)
	Yes	167 (40.7%)
Qualify to advise IBS patients on diet	No	76 (18.5%)
	Yes	334 (81.5%)
Cause/increase diarrhea in IBS patients	chocolate/caffeine	121 (29.5%)
	dairy products	188 (45.9%)
	Do not know	89 (21.7%)
Cause/worsen constipation in IBS patients	gluten-free diets	12 (2.9%)
	dairy products	110 (26.8%)
	Do not know	98 (23.9%)
	prune juice	18 (4.4%)
Appropriate diets for IBS patients	white bread/rice	184 (44.9%)
	Low FODMAP diet	250 (61%)
	Mediterranean diet	77 (18.8%)
Dairy and gluten elimination for IBS symptoms	Vegan diet	83 (20.2%)
	Do not know	169 (41.2%)
	No	47 (11.5%)
Recommended consumption for IBS patients	Yes	194 (47.3%)
	1 meal and 3 snacks	12 (2.9%)
	2 meals and 2 snacks	98 (23.9%)
	3 meals and 2-3 snacks	120 (29.3%)
Not recommended cooking method for IBS patients	Do not know	180 (43.9%)
	Baking	53 (12.9%)
	Frying	312 (76.1%)
	Grilling	45 (11%)
Healthy food for IBS	Fruits	363 (88.5%)
	High protein diet	181 (44.1%)
	Some dairy products	76 (18.5%)
	Starchy Carbohydrates	75 (18.3%)
Unhealthy food for IBS	Vegetables	358 (87.3%)
	FODMAPS	102 (24.9%)
	Insoluble fibres	125 (30.5%)
	Soybeans	128 (31.2%)
	Spicy food	358 (87.3%)

As shown in **Figure 1**, 22.9% of participants agreed that intermittent fasting helps with IBS symptoms.

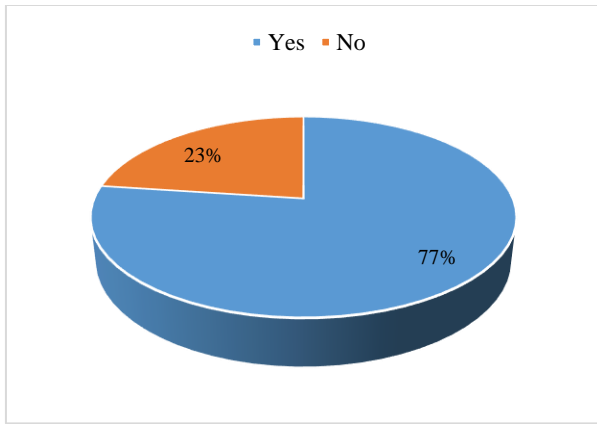


Figure 1. Intermittent fasting helps with IBS symptoms (n=410)

The recommended consumption for IBS patients was found to be different among age groups. For example, the percentage of participants who recommended 3 meals and 2-3 snacks per day was highest in the age group 18-21 (36.9%), followed by the age group 22-24 (19.8%), and the age group 25 or more (38.6%). The difference was statistically significant (p=0.008).

Regarding the not recommended cooking method for IBS patients, the percentage of participants who reported that frying is not recommended was highest in the age group 25 or more (88.6%), followed by the age group 22-24 (76.5%) and the age group 18-21 (72.6%). The difference was statistically significant (p=0.022).

Overall, the study results show that age is associated with awareness of participants towards IBS, as there were statistically significant differences in the responses to some questions among the different age groups (Table 3).

Table 3. Age in association with awareness of participants towards IBS (n=410)

Parameter	Age, y			P-value	
	18 - 21	22 - 24	25 or more		
IBS flares related to diet	No	32 (17.9%)	16 (8.6%)	1 (2.3%)	0.003
	Yes	147 (82.1%)	171 (91.4%)	43 (97.7%)	
Treated/related to IBS patients who had limited diet	No	107 (59.8%)	116 (62%)	20 (45.5%)	0.129
	Yes	72 (40.2%)	71 (38%)	24 (54.5%)	
Qualify to advise IBS patients on diet	No	41 (22.9%)	31 (16.6%)	4 (9.1%)	0.069
	Yes	138 (77.1%)	156 (83.4%)	40 (90.9%)	
Cause/increase diarrhea in IBS patients	chocolate/caffeine	43 (24%)	64 (34.2%)	14 (31.8%)	0.154

Cause/worsen constipation in IBS patients	dairy products	90 (50.3%)	74 (39.6%)	24 (54.5%)	0.241
	Do not know	40 (22.3%)	43 (23%)	6 (13.6%)	
	gluten-free diets	6 (3.4%)	6 (3.2%)	0 (0%)	
Appropriate diets for IBS patients	dairy products	43 (24%)	55 (29.4%)	12 (27.3%)	0.018
	Do not know	50 (27.9%)	40 (21.4%)	8 (18.2%)	
	prune juice	11 (6.1%)	7 (3.7%)	0 (0%)	
	white bread/rice	75 (41.9%)	85 (45.5%)	24 (54.5%)	
Dairy and gluten elimination for IBS symptoms	Low FODMAP diet	94 (52.5%)	122 (65.2%)	34 (77.3%)	0
	Mediterranean diet	41 (22.9%)	32 (17.1%)	4 (9.1%)	
	Vegan diet	44 (24.6%)	33 (17.6%)	6 (13.6%)	
Recommended consumption for IBS patients	Do not know	86 (48%)	76 (40.6%)	7 (15.9%)	0.008
	No	22 (12.3%)	14 (7.5%)	11 (25%)	
	Yes	71 (39.7%)	97 (51.9%)	26 (59.1%)	
	1 meal and 3 snacks	5 (2.8%)	7 (3.7%)	0 (0%)	
Not recommended cooking method for IBS patients	2 meals and 2 snacks	35 (19.6%)	51 (27.3%)	12 (27.3%)	0.022
	3 meals and 2-3 snacks	66 (36.9%)	37 (19.8%)	17 (38.6%)	
	Do not know	73 (40.8%)	92 (49.2%)	15 (34.1%)	
Intermittent fasting helps with IBS symptoms	Baking	22 (12.3%)	30 (16%)	1 (2.3%)	0.201
	Frying	130 (72.6%)	143 (76.5%)	39 (88.6%)	
	Grilling	27 (15.1%)	14 (7.5%)	4 (9.1%)	
Healthy food for IBS	No	48 (26.8%)	39 (20.9%)	7 (15.9%)	0.015
	Yes	131 (73.2%)	148 (79.1%)	37 (84.1%)	
	Fruits	156 (87.2%)	167 (89.3%)	40 (90.9%)	
Unhealthy food for IBS	High protein diet	101 (56.4%)	67 (35.8%)	13 (29.5%)	0.031
	Some dairy products	34 (19%)	34 (18.2%)	8 (18.2%)	
	Starchy Carbohydrates	37 (20.7%)	30 (16%)	8 (18.2%)	
Cause/worsen constipation in IBS patients	Vegetables	152 (84.9%)	165 (88.2%)	41 (93.2%)	0.031
	FODMAPS	54 (30.2%)	41 (21.9%)	7 (15.9%)	

Insoluble fibres	57 (31.8%)	53 (28.3%)	15 (34.1%)
Soybeans	50 (27.9%)	58 (31%)	20 (45.5%)
Spicy food	155 (86.6%)	160 (85.6%)	43 (97.7%)

Table 4 provides an overview of the association between gender and the participants' awareness of IBS. In general, the table shows no significant gender differences in awareness of IBS. The p-values for most of the parameters were not statistically significant.

The only parameter that showed a significant gender difference was whether the participant had been treated or was related to an IBS patient who limited their diet. Women were less likely to have treated or be related to an IBS patient who limited their diet compared to men (44.6% vs. 68%, p=0.017).

It is worth noting that the majority of participants in this study were female (68.3%). Among the female participants, 89.1% reported that IBS flares were related to their diet, and 81.4% were qualified to advise IBS patients on diet. The most commonly reported cause of diarrhea in IBS patients was dairy products (47.7%), while the most commonly reported cause of constipation was white bread/rice (43.9%). The majority of participants (59.3%) believed that a low FODMAP diet was an appropriate diet for IBS patients, while 75.1% believed that intermittent fasting could help with IBS symptoms. The majority of participants (88.4%) also believed that fruits were a healthy food for IBS, while 87% believed that spicy food was an unhealthy food for IBS.

Appropriate diets for IBS patients	white bread/rice	125 (43.9%)	59 (47.2%)	0.553
	Low FODMAP diet	169 (59.3%)	81 (64.8%)	
	Mediterranean diet	55 (19.3%)	22 (17.6%)	
	Vegan diet	61 (21.4%)	22 (17.6%)	
Dairy and gluten elimination for IBS symptoms	Do not know	117 (41.1%)	52 (41.6%)	0.959
	No	32 (11.2%)	15 (12%)	
	Yes	136 (47.7%)	58 (46.4%)	
	1 meal and 3 snacks	9 (3.2%)	3 (2.4%)	
Recommended consumption for IBS patients	2 meals and 2 snacks	59 (20.7%)	39 (31.2%)	0.001
	3 meals and 2-3 snacks	100 (35.1%)	20 (16%)	
	Do not know	117 (41.1%)	63 (50.4%)	
	Baking	41 (14.4%)	12 (9.6%)	
Not recommended cooking method for IBS patients	Frying	212 (74.4%)	100 (80%)	0.376
	Grilling	32 (11.2%)	13 (10.4%)	
	No	71 (24.9%)	23 (18.4%)	
Intermittent fasting helps with IBS symptoms	Yes	214 (75.1%)	102 (81.6%)	0.149
	Fruits	252 (88.4%)	111 (88.8%)	
Healthy food for IBS	High protein diet	139 (48.8%)	42 (33.6%)	0.026
	Some dairy products	56 (19.6%)	20 (16%)	
	Starchy Carbohydrates	60 (21.1%)	15 (12%)	
	Vegetables	247 (86.7%)	111 (88.8%)	
	FODMAPS	73 (25.6%)	29 (23.2%)	
Unhealthy food for IBS	Insoluble fibres	85 (29.8%)	40 (32%)	0.922
	Soybeans	92 (32.3%)	36 (28.8%)	
	Spicy food	248 (87%)	110 (88%)	

Table 4. Gender in association with awareness of participants towards IBS (n=410)

Parameter		Gender		P-value
		Female	Male	
IBS flares related to diet	No	31 (10.9%)	18 (14.4%)	0.311
	Yes	254 (89.1%)	107 (85.6%)	
Treated/related to IBS patients who had limited diet	No	158 (55.4%)	85 (68%)	0.017
	Yes	127 (44.6%)	40 (32%)	
Qualify to advise IBS patients on diet	No	53 (18.6%)	23 (18.4%)	0.962
	Yes	232 (81.4%)	102 (81.6%)	
Cause/increase diarrhea in IBS patients	chocolate/caffeine	87 (30.5%)	34 (27.2%)	0.171
	dairy products	136 (47.7%)	52 (41.6%)	
	Do not know	56 (19.6%)	33 (26.4%)	
Cause/worsen constipation in IBS patients	gluten-free diets	6 (2.1%)	6 (4.8%)	0.113
	dairy products	86 (30.2%)	24 (19.2%)	
	Do not know	63 (22.1%)	35 (28%)	
	prune juice	11 (3.9%)	7 (5.6%)	

Irritable Bowel Syndrome (IBS) is a chronic gastrointestinal disorder characterized by abdominal pain, bloating, and altered bowel habits [1, 3]. IBS is a prevalent condition, affecting approximately 10-15% of the global population, and it can significantly impact patients' quality of life [1]. The treatment of IBS is complex and requires a multidisciplinary approach, including dietary changes, lifestyle modifications, and medication. In this study, we aimed to assess patients' awareness of IBS and dietary habits related to the condition [2].

Our study included 410 participants, with a female-to-male ratio of 3:1. The majority of participants (78.3%) reported being aware of IBS, and 89.1% of participants knew that diet could affect IBS symptoms. Interestingly, there was no significant difference in the awareness of IBS or its association with diet between male and female participants. This finding is noteworthy, as previous research has suggested that women are more likely to seek medical care for IBS symptoms than men.

Our results showed that the majority of participants (66.5%) knew someone who had been diagnosed with IBS, and 43.3%

of participants reported experiencing IBS symptoms themselves. This finding is consistent with previous studies, which have shown that IBS is a condition that affects a significant portion of the population [1, 3, 7].

The majority of participants (81.4%) believed they were qualified to advise IBS patients on dietary changes. However, only 64.8% of participants were aware of the low FODMAP diet, which is considered the most effective dietary intervention for IBS. Additionally, the study found that only 47.7% of participants knew that dairy and gluten elimination could help alleviate IBS symptoms. Our study also found that 35.1% of participants recommended three meals and two to three snacks daily for IBS patients, while 20.7% recommended two meals and two snacks. Interestingly, only 3.2% of participants recommended one meal and three snacks per day, which is a common dietary recommendation for IBS patients.

The study found that 74.4% of participants believed frying was not a recommended cooking method for IBS patients. This finding is consistent with previous research, which has suggested that fried and fatty foods can exacerbate IBS symptoms.

Our results also showed that the majority of participants believed that fruits (88.4%) and vegetables (86.7%) were healthy foods for IBS patients, while spicy foods (87%) were considered unhealthy. Additionally, only 25.6% of participants believed that FODMAPS were unhealthy foods for IBS patients.

The findings of our study have important implications for the management of IBS. First, our study showed that the majority of participants were aware of IBS and its association with diet, which suggests that patient education efforts have been effective in increasing awareness of the condition. However, despite high levels of awareness, the study found that only a minority of participants were aware of the most effective dietary interventions for IBS, such as the low FODMAP diet. This finding highlights the need for continued patient education efforts to ensure that patients know the most effective dietary interventions for IBS.

Another important finding of our study was that the majority of participants believed they were qualified to advise IBS patients on dietary changes. However, only a minority of participants were aware of the most effective dietary interventions for IBS. This finding suggests that patients may not have accurate information about the best dietary interventions for IBS and underscores the importance of involving healthcare professionals in the dietary management of IBS.

CONCLUSION

The study found that most participants were unaware of the factors that cause or worsen IBS symptoms. Dairy products

were identified as one of the most common causes of constipation in IBS patients. The study also revealed that the majority of participants were not familiar with the low FODMAP diet, which is a proven dietary intervention that has been shown to be effective in managing IBS symptoms. The results also showed that the general population and IBS patients lack knowledge about the recommended consumption for IBS patients, with a large percentage being unsure about the appropriate meal frequency. Moreover, the study found that there is a lack of knowledge about recommended cooking methods for IBS patients, and the majority of participants were not aware of unhealthy food for IBS patients. The findings of this study highlight the need for increased public awareness and education about IBS management through diet. Health practitioners, nutritionists, and registered dietitians should collaborate to provide comprehensive dietary advice and promote the low FODMAP diet as a proven intervention for IBS patients. By improving knowledge and awareness, patients can manage their symptoms and improve their quality of life.

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CONFLICT OF INTEREST: None

FINANCIAL SUPPORT: None

ETHICS STATEMENT: Ethical approval was obtained from the research ethics committee of the King Fahad Armed Forces Hospital – Jeddah, Research and Ethics Committee Application number: [REC-467]. Informed consent was obtained from each participant after the study was explained in full and clarification that participation was voluntary. Data collected were securely saved and used for research purposes only.

Written informed consent was obtained from all individual participants included in the study.

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