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Irritable bowel syndrome following infectious COVID-19: East Java, Indonesia, 2023

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ABSTRACT

Irritable bowel syndrome (IBS) is a functional disorder that causes chronic abdominal pain without a known cause. It is a common, chronic gastrointestinal (GI) motility disorder with bothersome symptoms that often lower quality of life and activity. In addition, Patients and healthcare facilities also face significant financial costs. COVID-19 directly damages the digestive system and alters the complex interaction of physical, mental, and social factors that cause digestive problems. SARS-CoV-2 survivors in personal isolation will be examined for IBS prevalence. The dates of this descriptive cross-sectional study are January through April 2023. Rome IV criteria and an online questionnaire were used to confirm the diagnosis of IBS. The principal location where polls have been sent is East Java, Indonesia. The 96 COVID-19 survivors aged 18–60 of both genders was included during self-quarantine. There were 59 females (61.46%) and 37 males (38.54%). The prevalence of IBS was discovered to be 19 (19.79%) among a total of 96 patients. This could be because self-quarantined people have more stable living conditions than hospitalized people. Based on these findings, it is suggested that future research consider gender as the primary proxy for identifying irritable bowel syndrome (IBS).

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1. INTRODUCTION

Irritable bowel syndrome (IBS), formerly known as functional gastrointestinal (GI) disorders, is one of the most common disorders of gut-brain interactions and is thought to affect one in ten people globally [1]. According to further data, the prevalence of IBS is 10% and increasing, especially in Asian nations [2]. A different study estimates that 4.1% of people worldwide have IBS (95% CI: 3.9–4.2) [3], [4]. According to global data on IBS prevalence, Taiwan ranks first with a prevalence range between 17.5% and 22.1%, South Korea with a prevalence range between 6.6% and 15.5%, and Turkey with a prevalence range between 6.3% and 10.2% [5].

The prevalence of IBS correlates with three problems [5]. First, developed nations tend to see a rise in IBS. Regarding case reporting, second, not all people with suspected IBS visit the doctor immediately. Another barrier is the high cost of IBS therapy and the stigma in the community. Third, among the general

studies, the heterogeneity component was also discovered to be rather substantial. The various criteria employed are one of the more confusing elements. For example, the estimated prevalence of IBS is higher for the Rome III criterion than the Rome IV criterion. As a result, predictions of IBS prevalence are less precise [6].

In addition to its frequency, IBS harms health-related quality of life [2]. IBS patients are susceptible to depression, anxiety, and impairments in their daily function. Inadequate strategies to regulate the symptoms of these conditions contribute to a significant economic burden, as they result in excessive utilization of medical resources [7]. In 2019, there was an outbreak of a novel coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the city of Wuhan, China [8], infects more than 300 million people worldwide, making it a significant global public health concern [9]. SARS-CoV-2 has the potential to induce GI symptoms, including abdominal discomfort, diarrhea, nausea, and vomiting. This can be attributed to the existence of angiotensin-converting enzyme-2 (ACE-2) receptors within the GI epithelium [10], [11]. This study aimed to identify individuals with IBS after COVID-19 exposure who self-isolate in order to inform primary prevention strategies that may reduce future health burden. It is expected as well that clinicians will no longer view IBS as merely a somatization disorder, despite the fact that the disease process is related to psychological factors and IBS is distinct from psychiatric disorders [12].

2. METHOD

This descriptive cross-sectional study was conducted from January to April 2023 using a Rome IV adult diagnostic questionnaire with patients suffering from IBS and post-covid conditions who were in personal isolation. The diagnosis of IBS is determined using symptom-based criteria put towards by the Rome Foundation. The latest version of the criteria is known as the Rome IV criteria [13]. Information about Rome IV diagnostic was in Google Form Media's poll. Most of the inquiry information goes to people in the East Java area. The sampling procedure proceeds via a Google Form in which the questions are related to Rome IV criteria and include the following information: age, gender, weight, and height. The incoming data is subsequently recapitulated and tabulated in accordance with Rome IV's IBS indicators and the respondent's medical history. Using "Sample size" software, the sample size is determined with a 95% confidence level and a 5% margin of error. Based on the outcomes of the software evaluation, it can be concluded that 139 samples constitute the minimum sample size limit. In this investigation, validity and reliability tests were omitted due to the researchers' satisfactory perception of the measurement instrument provided by IBS measurement indicators with Rome IV. Purposive sampling is a method of sample and population selection in which the researcher actively chooses to meet specific criteria. Using this method, researchers can evaluate prospective study participants. The subjects of a study can be indirectly selected to represent the population being studied [14]. This descriptive cross-sectional study needs to collect data about a cross-section of the population, which can be the whole population or a sample of it. Cross-sectional research doesn't try to test hypotheses about the relationship, so it's a descriptive type of research. In the context of descriptive cross-sectional research, it is worth noting that there exists variation in the practice of formulating hypotheses among researchers. Consequently, the determination of sample size may differ depending on whether hypotheses are included or not. In the context of survey research conducted without a predetermined hypothesis, the selection of the sample size formula for estimating a single proportion with absolute precision is undertaken. In the context of survey research, when a hypothesis is formulated and a standard population is used for comparison, the appropriate sample size formula for conducting a hypothesis test to estimate a single proportion is selected [15], [16].

This study gives the prevalence rate at a certain point in time (point prevalence) or over a certain amount of time (period prevalence) [17]. This descriptive research uses a survey to look at the distribution of age, sex, pathological conditions, nutritional status, including height and weight. This design is used in research on healthcare systems to show how often certain traits happen [18]. It focuses on patients with covid who are not currently hospitalized. Because more participants test positive for covid but are not hospitalized than those who test positive for COVID-19 and are hospitalized. It is because, during the COVID-19 pandemic, a patient's mental state had a significant impact on whether or not they were willing to be hospitalized. An indirect questionnaire in a Google Form was used to collect data for this study. The data is then processed and collected in Microsoft Excel before being tabulated by calculating measurement items to determine precise variable criteria. For example, if abdominal pain occurs once per week for three months, the value is one, and vice versa.

3. RESULTS AND DISCUSSION

A total of 153 questionnaires were collected. The 96 questionnaires were collected from individuals quarantined at home following a covid diagnosis, and 57 questionnaires were collected from hospitalized patients as shown in Table 1. In our study in Table 2, the prevalence of IBS was found to be 19 (19.79%),

which was higher than in other Asian countries like Saudi Arabia, where the prevalence was 17.6%, and more significant than the global prevalence of IBS of 4.1% [19]. In our study, females were twice as likely as males to develop IBS, or a ratio of 2:1, consistent with previous studies [20], [21]. The role of sex hormones in the etiology of IBS can be deduced from epidemiological data on the prevalence of the disease in men and women. Women are more frequently diagnosed with IBS, with a 2:1 ratio for questionnaire-based diagnoses and a 4:1 ratio for practice-based diagnoses [22]. On the other hand, several studies in Asia discovered no gender differences in the prevalence of IBS [4]. Men and women differ in physiological parameters such as GI transit time, visceral sensitivity, central nervous system pain processing, and the specific effects of sex hormones on gut function. There may also be a role for gender differences in stress reactivity, neuroendocrine function, and autonomic nervous system function [4].

Table 1. Number of respondents

No	Criteria	Sample (n)	
1	Hospitals treat COVID-19 patients	57	(10.5%)
2	Home-quarantined COVID-19 patients	96	(89.5%)
Total number of respondents		153	(100%)

Table 2. Prevalence of IBS based on the sociodemographic characteristics of the participants

Category	IBS (n=19)		No IBS (n=77)		Overall (n=96)	
	n	%	n	%	n	%
Gender						
Male	6	(31.58%)	31	(40.26%)	37	(38.54%)
Female	13	(68.42%)	46	(59.74%)	59	(61.46%)
Age						
Young adults (18-39)	10	(52.63%)	39	(50.65%)	49	(51.04%)
Middle-aged adults (40-59)	8	(42.11%)	29	(37.66%)	37	(38.54%)
Old adults (above 59)	1	(5.26%)	9	(11.69%)	10	(10.42%)
BMI						
Less than 18.5	1	(5.26%)	6	(7.79%)	7	(7.29%)
18.5–22.9	5	(26.32%)	23	(29.87%)	28	(29.17%)
23.0–27.4	6	(31.58%)	36	(46.76%)	42	(43.75%)
27.5 and above	7	(36.84%)	12	(15.58%)	19	(19.79%)

According to our findings, the prevalence of IBS is based on the sociodemographic characteristics of the participants as shown in Table 2; there is a considerable correlation between age and IBS. IBS was strongly linked to the age of young people, which made up 52.63%. This finding aligns with prior studies that indicate the highest rates of disorder of gut-brain interaction (DGBI) occurrence were observed among individuals aged 18-39, followed by lower rates in the 40-64 age group, and the lowest rates in individuals aged 65 and above, across all DGBI categories and geographical regions [23]. The research reveals no association between obesity and IBS. It is consistent with previous research that found no significant difference between BMI and IBS [20], [21]. IBS is a functional GI disorder characterized by recurrent abdominal pain and stool frequency and abnormalities. Based on Rome IV criteria, recurrent abdominal pain for at least one day per week on average in the previous three months, accompanied by two or more of the following criteria: i) correlated with defecation; ii) associated with a change in excrement frequency; iii) these criteria must have been met for the past three months in conjunction with a change in the form (appearance) of the stool, with symptom onset occurring at least six months before diagnosis [24]. At least two of the three criteria must be met before they can be entered into the IBS criteria. Even though there were 96 people who were considered to be possible volunteers, only 19 of them met the criteria for the IBS.

The pathophysiology of COVID-19 GI damage is most likely multifactorial. Given the presence of ACE2 in intestinal epithelial cells, virus-mediated direct tissue damage is possible [25]. First, SARS-CoV-2 is similar to SARS-CoV and can infect humans by binding to the angiotensin-converting enzyme 2 (ACE-2) receptor. The compensatory proliferation of hepatocytes derived from bile duct epithelial cells causes the upregulation of ACE-2 expression in liver tissue, resulting in liver tissue injury [26]. Second, SARS-CoV-2 causes harm to the digestive system through an indirect or direct inflammatory response. Through a chain reaction, inflammatory factors and viremia may damage the digestive system. According to studies, approximately 53.4% of patients have viral nucleic acid detected in stool samples [27], [28]. Thus, SARS-CoV-2 may cause digestive symptoms by directly invading target cells or immune-mediated tissue and causing end-organ injury [29], [30]. The presence of angiotensin-converting enzyme type 2 receptors in several different organs throughout the body offers potential insight into the underlying mechanism of digestive symptoms [31]. IBS,

which affects up to 10.1% of patients after a GI infection, is one of these complications [32]. The common DGBI IBS has a multifactorial etiology and is linked to substantial morbidity [33], [34].

In critically ill COVID-19 patients with a high degree of systemic and intestinal inflammation, disorders of GI motor function up to severe motility derangement and pseudo-obstruction have been reported [35]. In conclusion, our results indicate that digestive symptoms are uncommon among COVID-19 patients. It is because this study focuses on respondents who are quarantined at home. Therefore, the symptoms experienced by respondents in this study were necessarily mild to moderate and did not necessitate hospitalization. It is also the reason why only one candidate meets IBS requirements. In contrast, individuals with severe COVID-19 are more likely to develop GI symptoms [36].

This study has several strengths. The information was collected from a representative sample of Jombang, East Java, residents. The 22 data was quickly collected. This study had several limitations: i) individuals from a singular city initially participated in an online survey, so we cannot generalize to the entire nation of Indonesia; ii) the most significant disadvantage of the web-based method is that it is only practical to obtain limited clinical data; iii) furthermore, there is a possibility of bias if specific individuals are prevented from participating in an online panel due to technical difficulties; iv) additionally, the data for this study were obtained from self-administered questionnaires, which are inherently subjective and may induce bias; and v) because IBS is an episodic disorder with symptoms that fluctuate over time, surveying patients at specific time points may be a limitation of this and other research methods. We propose that the federal investigation be conducted in Indonesia. A future investigation must establish a causal link between IBS and mental and physical variables, comorbidities, and health-related quality of life (HR-QoL).

4. CONCLUSION

According to this study, the prevalence of IBS in self-isolated patients was lower than the number of non-IBS patients in self-isolated patients. It could happen due to the less constant conditions experienced by isolated individuals in comparison to people requiring hospitalization. The occurrence of post-covid sequelae, specifically IBS, is observed to be less common among COVID-19 patients who prefer self-isolation. As previously said, estimating the prevalence of IBS is difficult, particularly in Indonesia. On the basis of these findings, it is suggested that future research consider gender as the primary proxy for identifying IBS. It is thought that future studies will include inquiries regarding gender in relation to IBS, as well as other factors that are unique to the Indonesian environment. This is a response to the current IBS research limitations in Indonesia.

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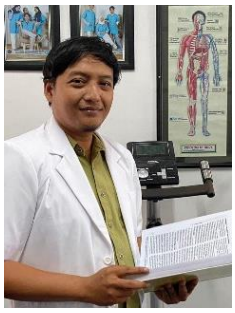

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