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Measuring Knowledge and Awareness of the Psychobiotics Role in Mental Health Among Some Groups of Society of Saudi People

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Abstract: Inaccurate or deficient knowledge about mental health is blamed for negative attitudes about mental disease and its treatment. The objectives of this study were to determine the sociodemographic variables influencing various socioeconomic groups in Saudi Arabia and to evaluate their present level of knowledge and awareness regarding mental health. 112 people in Saudi Arabia took part in a cross-sectional study. To measure mental health knowledge and awareness about psychobiotics, two distinct questionnaires (i.e., knowledge and awareness) were created. The result showed a variation in response Seventy-five per cent of individuals are aware that psychiatric disorders are common in Saudi Arabia. Nonetheless, 62.5% of them thought that a psychological illness was a complex illness. In addition, 79.3 per cent of participants felt that psychobiotics are important and play a role in preventing psychological problems, while 73.2% of respondents said they knew about probiotics. Of the participants, 73.2% had prior knowledge of probiotics and 79.3% had prior knowledge of psychobiotics. In addition, 16.1% of respondents claimed to be less aware, while about 60.7% of respondents claimed to be at a medium awareness level. Social media was cited by the majority of participants (41.1%) as their main information source for psychiatric illnesses, with specialists coming in second (27.7%). Despite the increased level of awareness of mental health in society, there is a lack of understanding regarding mental health and the functions of psychobiotic equilibrium. Understanding the gaps in our understanding of mental health issues and how they are treated is so crucial.

Keywords: Psychobiotics, Mental, Psychological, Awareness, Knowledge

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Introduction

Microbiota are elements composed of specific species of bacteria that are metabolically varied, generally complex, and found in the human large intestine. Bifidobacteria, clostridia, and other sulfate-reducing bacteria react differently to

different dietary components in ways that could be significant to health. Its main role is to recover energy from carbs that the upper intestine was unable to break down. This is accomplished by the fermentation process and absorption of the main

byproduct, short-chain fatty acids (SCFA), which account for 40–50% of the carbohydrates' energy content. The colonic epithelium (butyrate), liver (propionate), and muscle (acetate) are responsible for the metabolism of the three main SCFAs: acetate, propionate, and butyrate (Cummings and MacFarlane, 1997). Studies found that some bacterial genera that are prevalent in the distal gut may manufacture vitamins. Water-soluble vitamins like thiamine, folate, biotin, riboflavin, and pantothenic acid are common in diets but are also produced by gut microbes. In a similar vein, gut bacteria are thought to supply up to half of the daily need for Vitamin K. Interestingly, the vitamin forms found in food may not always have the same chemical structure as vitamins produced by bacteria. Vitamins generated from gut microbes are specially absorbed by several unique epithelium transporters that have been identified (Morowitz *et al.*, 2011). The gut-brain axis (GBA) connects the brain's emotional and cognitive regions to the functioning of the peripheral intestine through two-way communication between the central and enteric nervous systems. Studies have indicated that gut microbiota plays a significant role in shaping these relationships. Through signals from the gut microbiota to the brain and from the brain to the gut microbiota via neurological, endocrine, immunological, and humoral linkages, this relationship between microbiota and GBA appears to be bidirectional. Most of the findings were obtained using technical approaches that included infection investigations, probiotics, antibiotics, and germ-free animal models. The relationship between dysbiosis and functional gastrointestinal illnesses as well as central neurological disorders (such as autism and anxiety-depressive behaviour) provides evidence of microbiota-GBA interactions in clinical practice (Carabotti *et al.*, 2015). Psychobiotics are probiotics that, when consumed in a specific amount, help the host's mental health by interacting with commensal gut bacteria. According to studies, the hypothalamic-pituitary-adrenal (HPA) axis, inflammation, the immune system, and the synthesis of neurohormones and

neurotransmitters are the main ways of these bacteria to assist the body (Toro-Barbosa *et al.*, 2020). Electrophysiological thresholds of enteric nervous system neurons are regulated by gut microorganisms which further suggests that the ion transport regulated by cyclic adenosine monophosphate (cAMP) is impacted by the microbiome. Furthermore, research indicates that the impact of the microbiome on the enteric nervous system goes beyond neurons, as gut bacteria are also essential for the growth and maintenance of glial populations within the gut (Kunze *et al.*, 2009). By breaking down indigestible fibers, gut bacteria also generate a variety of neurotransmitters. These include the Bifidobacteria family producing GABA, the *Enterococcus* and *Streptococcus* families producing serotonin, the *Escherichia* family producing noradrenalin and serotonin, the *Bacillus* family producing dopamine and noradrenalin, and the *Lactobacilli* family producing GABA and acetylcholine. These chemicals most likely control synaptic activity in the enteric nervous system's proximal neurons (Lomasney *et al.*, 2014; Dinan *et al.*, 2015).

Materials and Methods

This study involves a survey that was sent electronically to perform a cross-sectional study. The survey was made with Google Forms, translated into Arabic, and sent to several Saudi Arabian social groups via WhatsApp and other social media platforms. To protect the privacy of every participant's information, all surveys were anonymous and did not use participant identifiers. A cover letter outlining the significance of the participant's contributions to the study was used to extend an invitation to join. A total of 112 people were included in the study. Three sections made up the survey: The first part asked questions about demographics, another about the participants' knowledge of the relevance of psychobiotics in mental health, and a third about their awareness regarding the importance and whether supplementary food products were readily available in the market. For statistical

Table 1: Demographic characteristics of the participants: age, gender, and education level

Item	Category	%
Age	16-20	34.8
	21-25	13.4
	26-35	15.2
	Above 36	36.6
Gender	Female	58
	Male	42
Educational level	High school	30.4
	University	17
	Postgraduate	52.7

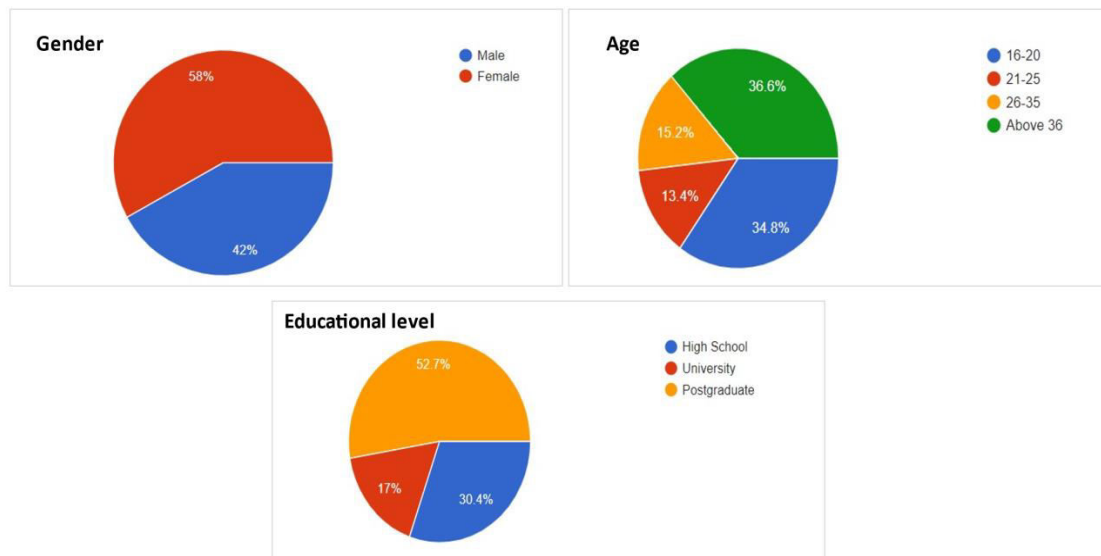


Fig. 1: Demographic characteristics of the participants: age, gender, and education level.

analysis, all the answers were copied onto Microsoft Excel spreadsheets. All statistical figures were created using Microsoft Excel tools, and descriptive statistics like percentages were used to categorize and interpret the data.

Results

Participant demographics:

Educating the public on the value of psychobiotics is essential to the successful implementation of treatment. Thus, the purpose of the questionnaire was to look at this in Saudi Arabia. 112 individuals in all have finished the survey (Table 1). Table 1

and Figure 1 show that approximately 36.6% of participants were older than 36 years, 65 (58%) of the participants were female, and 47 participants (42%) were male. Furthermore, around 52.7% of the participants were postgraduate level. Table 1 displays a comprehensive breakdown of the study participants' demographic profiles.

Knowledge of psychobiotic among survey participants:

About 70.5 % of participants know about the prevalence of psychological diseases in Saudi Arabia (Table 2; Fig. 2). However, they believed a psychological disease is a multifactorial disease

Table 2: Participants' knowledge about psychobiotics

Survey questions	Responses	%
In your opinion, how prevalent psychological diseases are in Saudi Arabia?	Prevalent	70.5
	Not prevalent	8.9
	Do not know	20.5
What are the reasons for the psychological diseases prevalence?	Genetics	17.9
	Gut	7.1
	Environment	22.3
	All above	62.5
Have you heard about probiotics' benefits?	Yes	73.2
	No	26.8
Have you heard about psychobiotics?	Yes	79.3
	No	20.7
Have you ever heard that the balance of gut bacteria may play a role in alleviating some psychological diseases?	Yes	34.8
	No	10.7
	Maybe	54.5

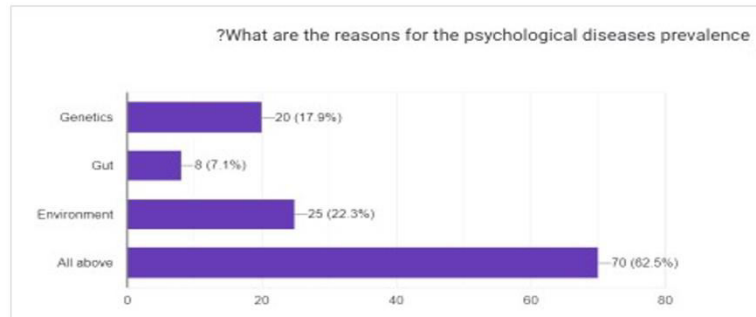
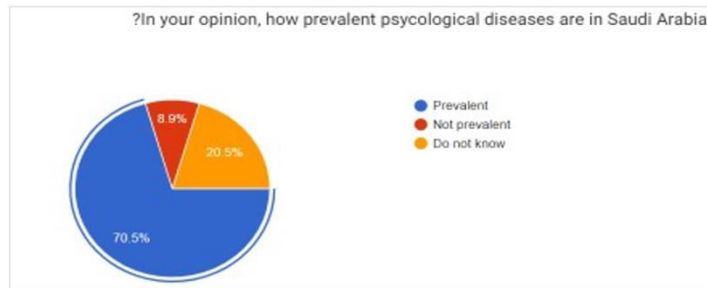


Fig. 2: Participants' awareness regarding psychobiotics.

Table 3: Participants' awareness of psychobiotics

Survey questions	Responses	%
What is your level of awareness regarding the psychobiotics?	High	23.2
	Medium	60.7
	Low	16.1
Do you have a family member who suffers from a psychological disease?	Yes	47.3
	No	52.7
Where do you get most of the medical information?	Social media	41.1
	Websites	14.3
	Specialist doctors	27.7
	Other sources	17
Have you ever encountered an awareness campaign or the importance of receiving a text message regarding awareness about probiotics?	Yes	42
	No	58
Have you ever used probiotics supplements?	Yes	52.7
	No	47.3
Do you know if it's available in supermarkets?	Yes	74.1
	No	25.9

(62.5 %). Furthermore, 73.2 % answered in the affirmative when asked about their knowledge of probiotics, and about 79.3 of participants agreed about the importance of psychobiotics and their role against psychological disorders. While 54.5 % were not sure about its role in alleviating some psychological disorders.

Awareness regarding psychobiotics among survey participants:

We investigated the participants' awareness of psychobiotics and how they found health information and guidance about these conditions in this survey segment (Table 3; Fig. 3). Almost 60.7% of respondents said they had a medium awareness level, and 16.1% said they were less aware. As per Table 3 and Figure 3, most participants (41.1%) reported using social media as their primary source of information about psychological diseases, with specialists coming in second with 27.7%. Additionally, 58% of them had never seen an awareness campaign or received information about the role and significance of psychobiotics through text messages.

Discussion

A class of probiotics known as psychobiotics influences behaviours and activities associated with the central nervous system through immunological, humoral, neuronal, and metabolic

pathways regulated by the GBA. This improves not only gastrointestinal function but also has anxiolytic and depressive properties (Cheng *et al.*, 2019). Four categories can be used to categorize the methods of action of psychobiotics: making neurotransmitters and neurochemicals, controlling the hypothalamic-pituitary-adrenal (HPA) axis, affecting the immune system, and making metabolites (Zielińska *et al.*, 2022). *Bifidobacterium* and/or *Lactobacillus* counts were reported to be decreased in people with major depressive disorder in studies (Aizawa *et al.* 2016). Additionally, it was shown that the gut microbiome of Alzheimer's patients contained fewer *Bifidobacterium* (Vogt *et al.*, 2017). A recent study found that in fecal samples from Parkinson's disease patients, the relative abundances of anti-inflammatory bacteria, such as those from the genera *Blautia*, *Roseburia*, and *Coprococcus*, were much lower. It has been discovered that children diagnosed with autism spectrum disorder had reduced relative microbiota abundances and overall bacterial diversity (Kang *et al.*, 2013). Moreover, attention deficit hyperactivity disorder is more likely to occur in people whose gut flora is dysregulated (Cheng *et al.*, 2019). Psychobiotics have the potential to modulate various neurotransmitters and proteins, such as brain-derived neurotrophic factor (BDNF), glutamate, gamma-



Fig. 3: Participant's awareness toward psychobiotics.

aminobutyric acid (GABA), serotonin, and excitatory-inhibitory balance (NEI), which are crucial for regulating mood, learning, memory, and cognitive processes (Cheng *et al.*, 2019). Numerous probiotic strains have been identified as psychobiotics based on animal research. When mice were given *Lactobacillus plantarum* PS128 (PS128), their behaviours related to anxiety and depression decreased. Corticosterone levels and inflammation were dramatically reduced with PS128. Notably, when compared to control mice, PS128 treatment markedly raised dopamine and serotonin levels in the striatum and prefrontal cortex (Liu *et al.*, 2015, 2016). A different study discovered a novel method for the advantageous application of probiotics and bee pollen in the context of neuroinflammation caused by cytokine alterations and the potential involvement of glial cells in the gut-brain axis (Alonazi *et al.*, 2022). In 1954, Brock Chisholm made the foresighted statement that "No physical health without mental health" (Kolappa *et al.*, 2013). Neuropsychiatric illnesses account for about 14% of the world's disease burden. Because of a lack of understanding of the interactions between mental disease and other health disorders, the burden of mental disorders has probably been underestimated (Prince *et al.*, 2007). A prior study on mental health awareness discovered that public education campaigns for depression should concentrate on raising people's knowledge of the conditions' risk factors and available treatments. To increase mental health literacy and dispel myths about depression in the general public, mental health promotion and educational initiatives are necessary. These initiatives should focus especially on older Saudi Arabian men (Al-Jadani *et al.*, 2021). The majority of low- and middle-income nations have generally seen a modest pace of advancement in the provision of mental health services. The current public health priorities and their impact on funding, the difficulties in providing mental health care in primary-care settings, the dearth of people with mental health training, and the absence of a mental health viewpoint in public health leadership are some of

the obstacles (Saraceno *et al.*, 2007). Health literacy and awareness are two sides of the same coin. Ignorance and disinformation have detrimental effects on prejudice and stigma (Srivastava *et al.*, 2016). Various direct and indirect instruments are designed to encourage and strengthen constructive modifications in societal perspectives. Campaigns to raise public awareness are among the most significant (Borawska, 2017) Reducing the frequency of psychological diseases and the high costs associated with medical care requires understanding the origins of these disorders, the value of psychobiotics, and potential prophylactic interventions. This study investigated the degree of public awareness and knowledge regarding the role of psychobiotics among various Saudi Arabian social groups. The majority of participants recognized the significance of having their food available, which was a noteworthy finding. Additionally, the majority of participants had never come across any advertising promoting psychobiotics or received SMS messages emphasizing their significance. It is concluded that, despite the heightened public awareness of mental health issues, little is known about mental health and the roles played by psychobiotic balance. It is essential to recognize the knowledge gaps regarding mental health concerns and their treatment.

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