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■ Research Article

An analysis of YouTube content about psychobiotics: Is the food and mood bond getting stronger?

Psikobiyotiklerle ilgili YouTube içeriklerinin analizi: Besinler ve ruhsal durum arasındaki bağ güçleniyor mu?

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Abstract

Aim: Psychobiotics have become a popular topic in recent years both on social media and in academia. The effects of individuals' diets and the probiotic supplements they use on their mental state have made psychobiotics a subject of curiosity. Our aim in this research is to evaluate the content of YouTube videos about psychobiotics.

Material and Methods: On 13/12/2023, the content of the first 50 english videos related to psychobiotics on YouTube was examined for quality and reliability and was independently evaluated by 2 separate medical doctors as 1 internal medicine specialist and 1 psychiatry specialist. Data such as likes, number of views, upload dates and uploaders of the videos were recorded. The content quality of the videos was recorded by calculating the DISCERN score and Global Quality Index score (GQS).

Results: The mean duration of YouTube videos about psychobiotics was 14.35±17.22 minutes. The mean GQS and modified DISCERN scores of the videos were 3.70±0.99 and 3.87±0.96, respectively. The evaluation results of two independent medical professionals who watched the videos showed a high positive correlation in terms of both GQS and DISCERN scores (r: 0.905 p<0.05, r: 0.908 p<0.05 respectively). The duration, number of likes and daily view counts of professional videos were significantly higher (p<0.05). 62% of the videos were uploaded by health channels, 28% by healthcare professionals and 10% by other individuals. GQS (p<0.05) and DISCERN (p<0.05) scores of videos uploaded by health professionals and health channels were significantly higher than others.

Conclusion: Since psychobiotics is known as a newly popular term among the public and in the academic field, it has been observed that YouTube videos in this field are relatively new, uploaded by more professional channels compared to other subjects, and have more satisfactory content than other fields in terms of quality and content. However, since the number of videos is low compared to more publicly known topics and it is a relatively new topic, it may be beneficial to increase the number and promotion of professional videos to increase society's knowledge about psychobiotics.

Keywords: YouTube, Probiotics, Psychobiotics, Content Analysis

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Öz

Amaç: Psikobiyotikler son yıllarda hem sosyal medyada hem de akademik alanda popüler bir konu haline gelmiştir. Bireylerin beslenme tarzlarının ve kullandıkları probiyotik takviyelerin ruhsal durumlarına etkisi psikobiyotikleri merak konusu haline getirmiştir. Bu araştırmadaki amacımız psikobiyotiklerle ilgili YouTube videolarının içeriklerinin değerlendirilmesidir.

Gereç ve Yöntemler: 13/12/2023 tarihinde YouTube üzerinden psikobiyotiklerle ilişkili ilk 50 İngilizce videonun içeriği kalite ve güvenilirlik açısından incelenmiş, 1 iç hastalıkları ve 1 psikiyatri uzmanı olmak üzere 2 ayrı tıp doktoru tarafından bağımsız olarak değerlendirmeye alınmıştır. Videolara ait beğeni, izlenme sayıları, yüklenme tarihleri, yükleyiciler gibi veriler kayıt altına alınmıştır. Videoların içerik kalitesi modifiye DISCERN skoru ve Global Quality Index skoru (GQS) hesaplanarak kaydedilmiştir.

Bulgular: Psikobiyotiklerle ilgili Youtube videolarının ortalama süresi 14.35 ± 17.22 dakikaydı. Videolara ait ortalama GQS ve modifiye DISCERN skorları sırasıyla 3.70 ± 0.99 ve 3.87 ± 0.96 idi. Videoları izleyen bağımsız iki ayrı tıp doktoruna ait değerlendirme sonuçları hem GQS hem de DISCERN skorları açısından yüksek pozitif korelasyon göstermekteydi (sırasıyla $r:0.905$ $p<0.05$, $r:0.908$ $p<0.05$). Profesyonel videoların süresi, beğeni sayısı ve günlük izlenme sayıları anlamlı olarak daha yüksekti ($p<0.05$). Videoların %62'si sağlık kanalları, %28'i sağlık profesyonelleri ve %10'u ise diğer bireyler tarafından yüklenmişti. Sağlık profesyonelleri ve sağlık kanalları tarafından yüklenen videoların diğerlerine göre GQS ($p<0.05$) ve DISCERN ($p<0.05$) skorları anlamlı olarak daha yüksekti.

Sonuç: Psikobiyotikler halk arasında ve akademik alanda yeni popülerleşen bir terim olarak bilindiği için bu alandaki YouTube videolarının görece yeni olduğu, diğer konulara nazaran daha profesyonel kanallarca yüklendiği, kalite ve içerik açısından diğer alanlara göre daha tatmin edici içeriklere sahip olduğu görülmüştür. Fakat video sayısının toplumca daha fazla bilinen konulara göre düşük olması ve nispeten yeni bir konu olması nedeniyle toplumun psikobiyotikler hakkındaki bilgisinin artması için profesyonel videoların sayısının ve tanıtımının artması faydalı olabilir.

Anahtar Kelimeler: Youtube, Probiyotikler, Psikobiyotikler, İçerik analizi

Introduction

Situations such as the spread of modern life, moving away from village life, changes in hygiene habits, changes in nutrition, and the use of antibiotics have differentiated the natural flora of the human body and resulted in major changes in the microbiota composition. It is known that one of the microorganism communities that undergo the most change is the human intestinal microbiota (1). In recent years, the importance of the intestinal microbiota has been increasingly understood and its place in the physiopathology of physical and mental diseases is being discussed more. It is an opinion supported by clinical research that many mental diseases can be triggered as a result of the predominance of microorganisms in the intestine in favor of pathogens. In particular, diseases such as autism, anxiety disorders, mood disorders, psychotic disorders, and eating disorders are the main mental illnesses investigated in terms of gut-brain axis interaction (2). Neurotransmitters such as dopamine, serotonin, noradrenaline synthesized by intestinal microorganisms and gut-brain communication

through the vagus nerve channel are known as the main underlying mechanisms (3, 4). The beneficial microorganism community that is good for mental illnesses when consumed was first defined as 'psychobiotics' by Ted Dinan in 2013 (4).

The fact that psychobiotics has been a known term for about the last 10 years and that it offers a functional and different perspective on the treatment approach and prevention of mental diseases seems to contribute to its popularity, although academic research is insufficient on this subject. As a matter of fact, from time to time, information pollution and incorrect guidance on the internet on little-known and little-researched topics in the medical field can be major problems. Especially on video platforms such as social media and YouTube, information pollution and incorrect guidance can spread quickly and cause the society to pin its hopes on wrong methods. In many studies where the quality and content analysis of YouTube videos on medical subjects were conducted, it was revealed that medical subjects were conveyed to the public with unreliable information by non-professional individuals. Since there are no limits on medical

guidance on platforms such as social media and YouTube and are not subject to content control practices, individuals who use these platforms as information sources may be harmed. YouTube, an online video sharing platform, has reached a significant audience around the world and provides services to billions of users in various fields every day (5). This suggests that the reliability of content, especially in the field of health, should be taken seriously. Our aim in this research is to evaluate YouTube videos about psychobiotics in terms of quality and content. This research was designed to contribute to the control of informative content about related medical conditions and provide guidance to patients by watching videos explaining psychobiotics.

Material and Methods

The term "psychobiotic" was searched in the YouTube database on 13/12/ 2023 and sorted by relevance. Videos with unnecessary content, videos presented in languages other than English, videos unrelated to psychobiotics, and videos with a duration of less than 1 minute were excluded. The remaining top 50 most relevant videos were selected as the subject of the study. As a result, the study included an analysis of 50 videos that showed the highest level of conformity and compliance with the determined criteria. Among a total of 559 videos about psychobiotics on YouTube, the first 50 most relevant videos that met the inclusion criteria were included in the research.

All videos accessed as a result of the search were independently evaluated comprehensively by 2 different doctors as 1 internal medicine specialist and 1 psychiatry specialist, focusing on assessing relevance, content and overall quality. In addition, the upload date, duration, uploaders, total number of views, daily number of views, and number of likes of each video were recorded in the data set and included in the evaluation. The average daily views of the videos were obtained by dividing the total number of views by the time elapsed since they were uploaded. Additionally, videos about psychobiotics were scored independently by two independent doctors using the Quality Criteria for Consumer Health Information (DISCERN) and Global Quality Scale (GQS) questionnaires.

Modified DISCERN scale developed by Singh et al. It includes a scoring system used to address the reliability of consumer healthcare services. This scale we used in our research is a five-point Likert type scale. Scoring for this scale includes five items rated on a 5-point Likert scale and allows us to evaluate the purposes, reliability, and bias of information sources. According to the scoring results, above three points indicate good content

reliability, three points indicate average content reliability, and below three points indicate poor content reliability (6).

The GQS scale, developed by Bernard et al., is a tool used to evaluate the quality of videos and is a Likert-type scale in which video content is scored from one to five according to the level of usefulness (7). A score of five indicates the highest quality, and a score of one indicates the lowest quality.

Since YouTube videos, which are freely accessible to everyone, were used in this research, official approval from the institutional ethics review board was not required and no funding was provided.

Statistical analyses were performed with IBM SPSS Statistics for Windows software (version 26; IBM Corp., Armonk, NY), and descriptive statistics including median \pm interquartile range, mean \pm standard deviation, and minimum–maximum values were performed to characterize the data. Compliance of the data sets with normal distribution was evaluated using the Shapiro-Wilk test, and Spearman correlation analysis was applied to determine the relationships between variables. The relationship between quality indicators and data was determined by multiple regression analysis. Mann-Whitney U test and Kruskal-Wallis test were used to detect significant differences between groups, and the $p < 0.05$ value was accepted as statistically significant.

Results

The average duration of the first 50 videos accessed on YouTube was 14.35 ± 17.22 minutes, the average number of likes was 944.56 ± 3952.20 , and the average number of views per day was 30.56 ± 155.58 . Information on the main features of the videos about psychobiotics is presented in Table 1. 31 (62%) of the videos included in the study were uploaded by health channels, 14 (28%) were uploaded by healthcare professionals and 5 (10%) were uploaded by others. The match rate between the two authors regarding the evaluations of the videos was measured by the Cronbach alpha coefficient. The resulting DISCERN and GQS had a significant and positive correlation, and there was strong agreement between the authors (Table 2).

Table 1. Main features of videos

	Min	Max	Mean \pm SD
Video duration (minute)	1.03	58.37	14.35 \pm 17.22
Like count	0	21000	944.56 \pm 3952.20
Daily View count	0	1059.72	30.56 \pm 155.58
Upload Time (month)	4	132	36.18 \pm 32.37
Total View count	10	763000	26992.34 \pm 125345.60
GQS	2	5	3.70 \pm 0.99
DISCERN	2	5	3.87 \pm 0.96

Table 2. Correlation and Coefficient between two observer

	Mean	SD	R (Spearman)	p	Cohen's Kappa
GQS-1	3.78	1.02	0.905	<0.001	0.727
GQS-2	3.62	1.01			
DiSCERN-1	3.96	0.99	0.908	<0.001	0.748
DiSCERN-2	3.78	0.98			

While there was no difference in GQS and DISCERN scores among the videos uploaded by health channels and medical professionals, these scores were significantly lower in the videos uploaded by other individuals. The comparison of the quality and content scores of the YouTube videos included in our research according to uploaders is presented in Table-3.

Table 3. Quality and content scores according to uploaders

	Health Channels (n:31)	Medical Professionals (n:14)	Other/Personal (n:5)	p-value
GQS	3.84±0.93	3.93±0.83	2.20±0.45	0.005
DiSCERN	4.08±0.89	3.89±0.88	2.50±0.50	0.007

Kruskal-Wallis test was applied.

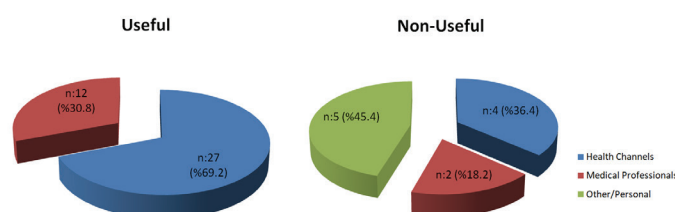
According to the subjective evaluations of the authors, whether the video contents are useful or not is also recorded, and a comparison of the features of useful and non-useful videos is shown in Table-4.

Table 4. Comparison of the useful and non-useful videos

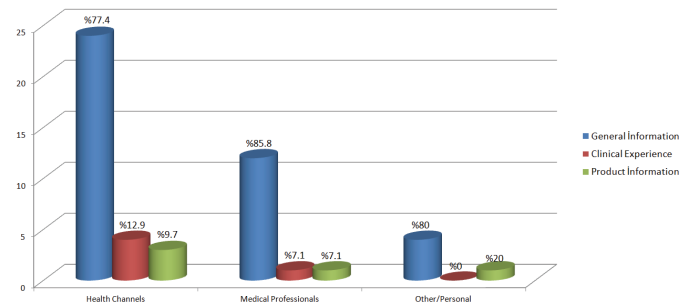
	Useful(n:39)	Non-Useful (n:11)	p-value
Video Length	17.57±18.21	2.92±2.72	0.002
Likes	1184.95±4455.11	92.27±301.06	0.002
Daily Views	38.62±175.78	1.99±6.10	0.007
Upload Time (month)	40.10±33.82	22.27±22.72	0.098
Total Views	34026.51±141482.31	2053.00±6615.88	0.003
GQS	4.09±0.71	2.32±0.46	<0.001
DiSCERN	4.27±0.63	2.45±0.48	<0.001

Mann-Whitney U test was applied.

A comparison of useful and non-useful videos according to their uploaders is presented in Figure-1 (Pearson Chi-Square test used $p<0.001$).


Figure 1. Comparison of useful and non-useful videos according to uploaders

When the videos were evaluated in terms of content, 40 (80%) of them contained general information, 5 (10%) contained clinical experience, and 5 (10%) contained commercial product information (Figure 2) (Pearson Chi-Square test used. $p:0.813$).


Figure 2. Video contents according to uploaders

Discussion

In recent years, there has been an increase in the number of academic studies relating issues such as autism, depression, anxiety, sleep problems, bipolar disorder, psychotic disorders and eating disorders to the intestinal microbiota, and it seems inevitable that this situation will lead to the search for treatment over time (8, 9). Psychobiotics, which have the potential to be used in treatment, will thus become a subject that is more frequently discussed and researched. In this respect, our research offers the perspective of the digital world on the treatment part of mental health and gut relationship. The YouTube algorithm, designed to examine the large content of many videos on the YouTube site and determine the high quality and relevant ones, works with an increasingly diverse and versatile system consisting largely of user feedback. Therefore, it is noteworthy that the results of search queries for a term may differ when performed by different users at different times (5). However, in our study, we aimed to address the basic dimensions that characterize the selection of quality videos in terms of content and professionalism and to evaluate the issues that individuals should pay attention to when choosing videos.

According to the basic findings of our research, the mean duration of videos related to psychobiotics is 14.35 minutes, the mean number of likes is 944.56, the mean daily views are 30.56, and the mean time since the upload date is 36.18. The mean GQS and DISCERN scores of the videos are 3.70 and 3.87, respectively. It was observed that most of the videos were uploaded by health channels and health professionals, while the remaining part was uploaded by others. It was determined that the GQS and DISCERN scores of videos belonging to health channels and medical professionals were significantly higher. Doctors who watched and evaluated the videos divided the content

into two as useful or non-useful and made a comparison, and it was determined that useful videos were longer in duration, had more likes and daily/total views, and had higher GQS and DISCERN scores. Most of the useful videos are uploaded by health channels and medical professionals, while non-useful videos consist mostly of videos uploaded by others. When the video contents were examined, it was determined that they largely contained general information, and it was understood that a small number of videos provided information on clinical experience and psychobiotic product information.

As a result of the literature review, it was determined that our research is the first video content and quality analysis research on psychobiotics. However, there are many YouTube studies conducted in other medical fields (10, 11). Studies examining YouTube videos, especially on psychiatric and general medical subjects, have found that quality scores and reliability in terms of content are low and emphasized the need to increase medical professional videos (12, 13). In our research, the number of videos uploaded by independent individuals is relatively low and the contents seem to be of higher quality than other areas. The main reason for this may be that psychobiotics, the subject of our research, is a little-known topic among the public. In a previous similar study, the average duration of the videos was 11.40 minutes, while in our study this duration was 14.35 minutes. Although the times are similar, the mean view count was found to be 113299 in the same research, which is quite higher than our research. The reason for this may be that psychobiotics is a newly popular topic and there are relatively fewer videos. It was also determined that the average number of likes of the videos in our research was lower than similar studies in the literature (14). It is thought that the reason for this is that there were fewer videos in our study and they were uploaded in later years. There are fewer videos on the selected topic 'psychobiotics' in our research compared to other similar studies (14, 15). In this case, it may be related to the fact that psychobiotics are a newly widespread topic. The fact that the number of videos, views and likes in general is low compared to other YouTube analysis on medical subjects may be related to the fact that psychobiotics is a relatively less known and less studied subject and is a term that has just begun to become widespread in the academic field. It is expected that topics that are more well-known in society will have more views and likes. However, the emergence of the term psychobiotics in the last 10 years and the increasing popularity of functional perspectives on mental illnesses may cause this topic to

become a topic that will be covered more on social media in the coming years. Because in recent years, a holistic perspective on medical problems has become an increasingly accepted issue (16, 17). Therefore, it seems quite realistic that the relationship between mental problems and the intestinal microbiota will attract more attention in a short time and become a subject of more curiosity in society. Our research can be considered as an important analysis study that shows that YouTube videos are of a quality that cannot be underestimated for those who look at mental health from the perspective of intestinal health, and also reveals the need for more content.

Although this study is the first analysis to examine video content related to psychobiotics, it should not be ignored that it has some limitations. The main limitations are that only a limited number of videos were included in the study, the videos were evaluated by only two authors, only two scales were used, and only English videos were evaluated. Additionally, YouTube videos offer short-term validity as they are content that can be instantly deleted and uploaded. Finally, our research does not include the patients' perspective since it only covers the evaluation results of physicians.

Conclusion

YouTube has become a social media platform that is frequently used by both patients and physicians, thanks to its features such as developing content and accessibility. In this way, videos of medical professionals can be compared with lower quality videos, creating a new field of research. Videos about psychobiotics on YouTube were analyzed in detail by our research, and significant differences were detected in terms of content and information quality compared to previous video analyses. Despite this, although it is a relatively little-known topic, the quality level of content about psychobiotics is remarkable. Preferring videos with quality content for both patients and physicians, paying attention to factors such as the uploader, the popularity of the video, the total number of views, and as a result, using this platform as a source of information seems to be a good option for intriguing topics.

Conflict of Interest/ Funding

Authors declare no conflict of interest.

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