Bulletin of the Transilvania University of Braşov
Series V: Economic Sciences • Vol. 14(63) No. 1 – 2021
https://doi.org/10.31926/but.es.2021.14.63.1.3

DIGITAL TOOLS FOR INFORMATION ON MENTAL HEALTH. DOES WHAT WE DO AFFECT THE WAY WE PERCEIVE THEM? A QUANTITATIVE STUDY AMONG THE ADULT POPULATION IN BRAȘOV, ROMANIA

A. I. M. TUDOR[1] **G. BRĂTUCU[2]**

Abstract: *This paper discusses whether and to what extent the occupational level of the adult population in Brasov County affects the perceptions regarding the digital tools' importance for information on mental health disorders such as depression and how the population with different occupational levels perceives and assimilates the digital tools for mental health needs. A quantitative marketing research was conducted among 514 adults from Brasov County. The ANOVA test was applied to achieve the set goal. The outcomes are useful for academics and practitioners to design sustainable digital health policies and create efficient prevention campaigns for depression, by focusing on digital tools.*

Key words: *digital tools, mental health, depression, occupational level, quantitative marketing research.*

1. Introduction

Mental health and its related conditions started to capture the world's attention and raise concerns worldwide in the last years (Tudor, 2020b). Moreover, depression is a condition among the largest contributors to the global burden of disability (World Health Organization, 2020), and which in Romania has an incidence rate of about 5% according to the Romanian Ministry of Health (Ministerul Sănătății, 2019). Depression affects not only individuals' health, but also their productivity (Park, et al., 2016). Therefore, occupation becomes an important vector to be considered in studying the way mental health-related conditions affect the productivity and life of different

[1] Transilvania University of Braşov, andra.tudor@unitbv.ro, ORCID ID: 0000-0002-5732-1644
[2] Transilvania University of Braşov, gabriel.bratucu@unitbv.ro, ORCID ID: 0000-0002-9636-3660

categories of individuals on the one hand, but also in studying, developing, and implementing specific programs to prevent such diseases, this implying: health education programs, suitable information means on mental health, proper prevention campaigns and so on.

Digitization changes the way individuals and organizations behave in all markets. We seek information differently, we perceive services differently, we purchase differently. Health care services tend to pursue the path of digitization, as providing patient-centred services is the ultimate goal for most health systems. Considering that digital health is a goal for most health systems, but also that nowadays digital tools have become almost indispensable when it comes to information, communication, and promotion, this paper aims to determine if and to what extent the different occupational categories of the adult population in Brasov County affect the perceptions regarding the digital tools' importance for information on mental health disorders such as depression, and how they perceive and assimilate digital tools for their mental health needs.

The paper is structured as follows: the 1st section comprises the theoretical background by reviewing the current status of the literature. The 2nd section states and explains the research methodology, while the 3rd section focuses on the results and discussions. In the final section, conclusions and proposals are presented by the authors.

2. Background

The digitalization and the Internet play an increasingly important role, affecting and transforming society as a whole, all areas of activity and healthcare services being of no exception (Lapão, 2016). Numerous studies proved that implementing digital solutions can be effective in managing and improving health conditions overall, as well as in treating depression (Berrouiguet, et al., 2018; Figueroa & Aguilera, 2020; Ravoire, et al., 2017).

Depression affects not only individuals' health, but also labour productivity if talking about workers. Employees affected by depression tend to register more loss productive time, of about 5,6 h/week, than the employees not affected by depression (about 1,5 h/week) (Stewart, et al., 2003). As depression comes with at-work performance deficits and decreased labour productivity, prevention becomes an important topic. But prevention cannot be done without information and promotion on mental health among the different occupational categories, so the information and communication means are of interest, together with knowing exactly how the different occupational categories behave, how they consume information, and if and how they communicate on mental health-related issues (European Commission, 2014; World Health Organization, 2004).

Digitization became a crucial matter for most domains of activity. Health care through digital technologies is continuously increasing, as studies highlighted the changes and the added-value digitization produces worldwide for the patients' care (Tudor, 2020a). However, using new technologies for the health and wellbeing of the population is difficult to achieve, as one must consider not only the IT&C infrastructure (Binder, 2008) or the financial capacities of the systems to go digital but also the determining factors and the behavioural changes occurring at the consumers' level (Chanda, 2019). A better

understanding of the demographic, social, and financial factors and how they affect the way consumers relate to digitization and technology is crucial for achieving digital health in general, provide patient-centred services and treatments, and preventing medical conditions in particular.

3. Methodology

The main objective of this paper was to determine whether and to what extent the occupational level of the population influences the way the adult population of Brașov County, Romania, perceive the importance of digital tools (i.e., mobile apps, websites, online platforms, etc.) for information on mental health issues such as depression or anxiety. Moreover, another objective was to determine how the adult population of Brașov County, having different occupations, perceives and assimilates digital tools for mental health needs.

In this respect, quantitative marketing research based on a survey was carried out. The data collection happened through a computer-administered questionnaire via the Internet. The applied questionnaire comprised a total of 29 questions, of which 23 questions regarded the opinions, perceptions, attitudes, and behaviours of adults in Brașov County on the use of digital tools for depression prevention, while the remaining 6 questions were meant to identify and characterize the participants of the study. A total of 514 subjects, women and men over the age of 18 living in Brașov County participated in the study. The participants' answers to each question were manually coded and the Statistical Package for Social Science (SPSS) version 25 was used to manipulate the collected and coded data.

To achieve the purpose of this paper, the research was based on an explanatory method often used in marketing research, namely the analysis of the variance (ANOVA). Therefore, the total variance of the dependent variable – in this case, the importance of digital tools for information on depression (*Yij*) – was decomposed in two variances: the variance caused by the independent variable – the occupational level of the adult population in Brașov County (*Cj*) - on one hand, and the residual variance (*eij*). The dependent variable was measured on a 5-step interval scale with bipolar adjectives of opposite meaning (whereas 1 = "not at all important", 5= "very important", and the distance between the steps of the scale being equal), while the independent variable was measured by a question constructed on a nominal scale with a single choice. The null hypothesis (H0) assumed that there is no link between the occupational level of Brasov County's adult inhabitants and their appreciations regarding the importance of digital tools for information on mental health issues such as depression.

The general model of the ANOVA analysis is the following:

$$Y_{ij} = \overline{\overline{Y}} + C_j + e_{ij} \quad (1)$$

whereas:

Yij= the observed values of the dependent variable, distributed according to the *j* modalities of the independent variable;

(Y) = the overall mean of the dependent variable;
Cj= the effect of level j of the independent variable;
eij= the error corresponding to the effect of other influencing factors.

The limitations of this study are related to the impossibility to extrapolate the results, because of the non-probabilistic sampling method and the data collection technique used. Other limitations of this study can be related to potential misunderstandings of the questions by the participants, as well as to the limitation of the number of participants in the research since participating in the study required access to IT&C devices and the Internet. The lack of access to these tools led to the impossibility to control and obtain a sample to fully cover the segments of age, occupation, education according to the structure of the researched population.

4. Results and Discussions

To perform the analysis, it is considered important to have an overview of how the studied population perceives the digital tools in terms of importance in informing themselves on mental health-related issues such as depression. Therefore, the frequencies at the sample level for the independent variable in this study are stated in Figure 1.

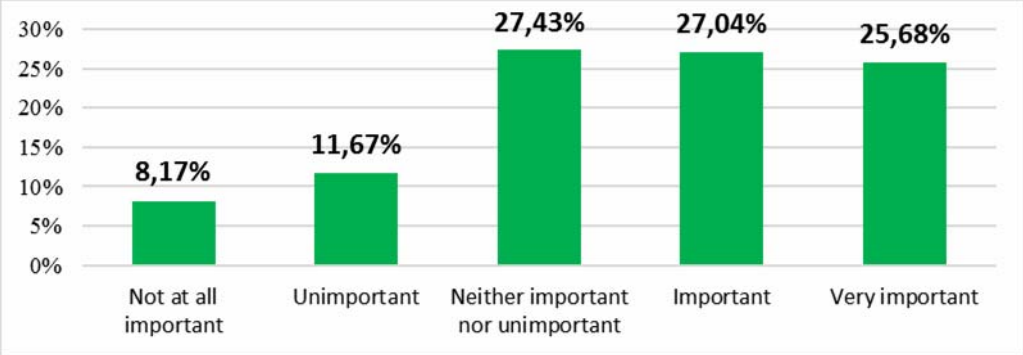

Fig. 1. *The importance of digital tools for information on mental health issues (depression)*

As emphasized in Figure 1, out of the 514 research participants, 25.68% consider that the digital tools are very important for informing about mental illnesses such as depression, while 27.04% consider them important for this purpose, choosing the 4th level of the scale. At the same time, at the sample level, a little over 8% of the adults living in Brașov County think that digital tools are not at all important as a means of information on mental health related issues, and 11.67% consider them rather unimportant. The majority of the sample consider that digital tools are neither important nor unimportant means of information for mental health-related issues such as depression. The descriptive statistics indicators for this considered variable are highlighted in Table 1.

Table 1

The descriptive statistics indicators of the dependent variable

To what extent do you think that digital tools are important for information on mental health?	**N**	**Mean**	**Median**	**Mode**	**Std. Deviation**
	Valid	**Missing**			
	514	0	3.5039	4.00	3.00

The mean for the respondents' assessments regarding the degree of importance of the digital tools for information on conditions such as depression is 3.50 points on a scale from 1 to 5 (1-"Not at all important", 5-"Very important"), this leading to the idea that, overall, they tend to perceive digital tools rather important for the information on mental health-related conditions. The other indicators which measured the central tendency were the median, having here the value of 4 ("Important"), and the mode which in this case is equal to 3 ("Neither important nor unimportant"). The dispersion indicators measured for this variable were the Standard Deviation, having the value of ≈1.22, and the Variance which in this case is ≈1.49.

The sample structure based on the occupational level is emphasized in Figure 2.

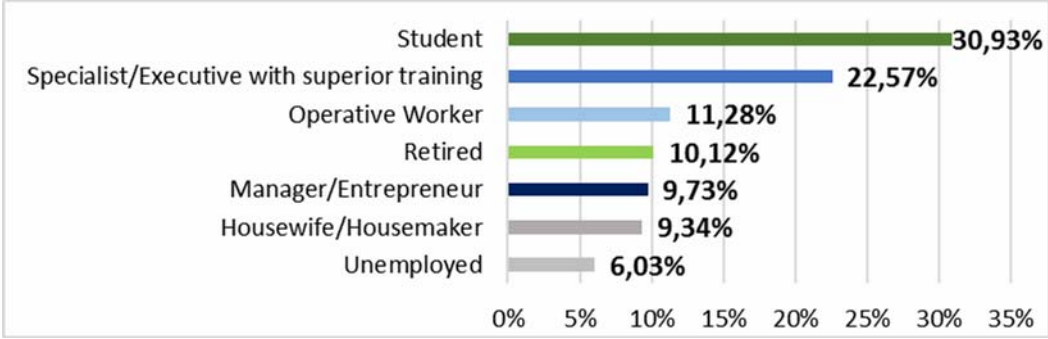

Fig. 2. *Sample structure according to the occupation*

According to the structure of the sample based on the occupation, 50 of the respondents (9.73%) are Managers/Entrepreneurs, 116 respondents (22.57%) - Specialists/Executives with superior training, while 159 respondents are Students (30.93%). There are 58 people (11.28%) as operative workers. At the sample level, 31 persons (6.03%) are unemployed, 52 (10.12%) retired persons, and 9.34% (48 persons) are Housewives/Housemakers.

Thus, having an overview of the two considered variables, the authors proceeded to test the link between the occupation of the Brașov County's inhabitants and their appreciations regarding the importance of the digital tools for information on mental health conditions such as depression, starting from the aforementioned null hypothesis (H_0).

The data in Table 2 indicate the existing differences between the means at the group level.

Descriptive group statistics Table 2

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max.
					Lower Bound	Upper Bound		
Manager/Entrepreneur	50	3.8800	1.09991	.15555	3.5674	4.1926	1.00	5.00
Specialist/Executive S.T.	116	4.1293	.88985	.08262	3.9657	4.2930	2.00	5.00
Student	159	3.5094	1.08422	.08598	3.3396	3.6793	1.00	5.00
Operative Worker	58	4.2414	.84418	.11085	4.0194	4.4633	1.00	5.00
Unemployed	31	2.8065	1.01388	.18210	2.4346	3.1783	1.00	5.00
Retired	52	2.1346	1.13809	.15782	1.8178	2.4515	1.00	5.00
Housewife/Housemaker	48	2.6250	1.10367	.15930	2.3045	2.9455	1.00	5.00
Total	514	3.5039	1.22075	.05385	3.3981	3.6097	1.00	5.00

As indicated in the table above, in the group of retired persons, the mean is lower than those of the other groups. The lowest mean is observed at this group's level, of only 2.13 points on a scale from 1 to 5, while the highest mean belongs to the group of Operative Workers, which is 4.24 points on the same scale.

Differences can be observed among all the existing groups, so to analyse their statistical significance, the equality of variances hypothesis was tested (Table 3). Testing the differences between means for signs of a relationship between the two considered variables was based on the variance analysis table (ANOVA test) (Table 4).

Levene's Test of Homogeneity of Variances

Table 3

Levene's Statistics	df1	df2	Sig.
2.924	6	507	.008

As of Table 3, it can be observed that the F*calc* equals 2,924. This value was compared to a critical value from the Fisher's Distribution Table chosen according to the significance level $\alpha = 0.05$, df1=6, and df2=507. The value was calculated using the FINV function in Microsoft Excel. F*calc* = 2.924 > F0.05,6,507= 2,116, which means that the authors had to reject the null hypothesis (H0) and accept the alternative one instead (H1).

That is, it can be guaranteed with a 95% probability that the variances regarding the assessments of the importance of digital tools in mental health (depression) information are different in the case of occupational groups. The same decision can be made based on Asymp. Sig. = 0.008, which is lower than $\alpha = 0.05$.

Variance Analysis table (ANOVA) Table 4

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	233.649	6	38.941	37.192	.000
Within Groups	530.843	507	1.047		
Total	764.492	513			

By comparing the F*calc*, as of Table 4, with the F0.05,6,507, the following can be asserted: F*calc* =37.192 is higher than F0.05,6,507= 2,116, so the null hypothesis (H0) has to be rejected by the authors and the alternative hypothesis is accepted (H1). According to this, there is a connection between occupational level and the assessments of the importance of digital tools in mental health information of the adults living in Brașov County. The same decision can be made based on the significance level Sig.=0.00< α= 0.05.

5. Conclusions

The main objectives of this paper were to analyse whether and in what manner the different occupational categories of the adults in Brasov County influence individuals' perceptions on digital tools' importance for information on mental health, and how they perceive and assimilate such tools for their mental health needs. The results emphasize that there is a link between occupation and the assessments of the digital tools' importance on information on the mental health of the adults in Brasov County, in the sense that adults working in higher positions, such as Specialists/Executives with superior training, and Managers are appreciating the digital tools' importance more positively than the adults belonging to the Unemployed, Retired or Housewife/Housemaker categories and they are more open to embracing digital instruments for information and communication on mental health conditions such as depression. Moreover, there are also gaps between the Students and Operative Workers and the above-mentioned categories, and this could be explained by the fact that these are mostly part of the digital native generation and are more open and ready to adopt and use such solutions. The authors conclude that the outcomes of this study are relevant for academics and practitioners to properly design and create sustainable digital health policies, and generate efficient prevention campaigns for depression by focusing on technology and integrating specific digital means and tools for people belonging to different occupational categories.

The authors recommend further research on this topic, especially in terms of territorially extending the research, analysing other counties in Romania. Moreover, further research of the way other factors such as culture, financial, and other demographic factors affect the perceptions on, adoption, and use of digital tools for mental health-related aspects is needed.

References

Berrouiguet, S., et al., 2018. From eHealth to iHealth: Transition to Participatory and Personalized Medicine in Mental Health. *Journal of Medical Internet Research*, 20(1):e2

Binder, L. 2008. *The power of consumerism. Changes accelerating in healthcare purchasing*. [Online] Available at: https://www.modernhealthcare.com/article /20081110/NEWS/811079988/the-power-of-consumerism [Accessed February 2021].

Chanda, P., 2019. *The Growing Importance of Digital Health Explained.* [Online] Available at: https://digitalhealthbuzz.com/the-growing-importance-of-digital-health-explained/ [Accessed February 2021].

European Commission, 2014. Promoting mental health in the workplace: Guidance to implementing a comprehensive approach. *Employment, Social Affairs & Inclusion*, [Online] Available at: https://ec.europa.eu/social/BlobServlet? docId=13879&langId=en [Accessed February 2021].

Figueroa, C.A. and Aguilera, A., 2020. The need for a mental health technology revolution in the COVID-19 pandemic. *Frontiers in Psychatry*, 11, p. 523.

Lapão, L.V., 2016. The Future Impact of Healthcare Services Digitalization on Health Workforce: The Increasing Role of Medical Informatics. *Studies in Health Technology and Informatics*, 228, pp. 675-679.

Ministerul Sănătății, 2019. *Ziua Europeană Anti-Depresie. Analiză de situație.* [Online] Available at: https://insp.gov.ro/sites/cnepss/wp-content/uploads/2017/04/Analiza-situatie-ZEAD-2019-.pdf [Accessed January 2021]

Park, H., et al., 2016. Employment and occupation effects on late-life depressive symptoms among older Koreans: a cross-sectional population survey. *Annals of Occupational and Environmental Medicine*, 28, 22. DOI https://doi.org/10.1186/s40557-016-0107-2.

Ravoire, S., et al., 2017. Advantages and limitations of online communities of patients for research on health products. *Therapies*, 72(1), pp. 135-143.

Stewart, W.F., et al., 2003. Cost of lost productive work time among US workers with depression. *Jama*, 289(23), pp. 3135-3144.

Tudor, A.I.M., 2020a. Preventing depression through digital tools. A qualitative study among adults in Brașov. *Bulletin of the Transilvania University of Brașov. Series V:* 12(62), 2, pp. 25-34, DOI: https://doi.org/10.31926/but.es.2020.13.62.2.3.

Tudor, A.I.M., 2020b. Showing care for mental health via digital tools. How much does age matter?. *Proceedings of the 11th International Conference of Doctoral Students and Young Researchers: Emerging Markets Economics and Business*, No.8 - December 2020, Oradea University Press, pp. 459-462.

World Health Organization, 2004. Promoting mental health: concepts, emerging evidence, practice. *Summary Report*. [Online] Available at: https://www.who.int/mental_health/evidence/en/promoting_mhh.pdf [Accessed February 2021].

World Health Organization, 2020. *Depression and Other Common Mental Disorders. Global Estimates*. [Online] Available at: https://www.who.int/mental_health /management/depression/en/ [Accessed January 2021].