The effect of mental health literacy training given to primary care physicians on beliefs and attitudes towards mental illnesses: A randomized controlled trial

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SUMMARY

Objective: This study aimed to assess the impact of mental health literacy education on the beliefs and attitudes of family physicians in Turkey regarding mental illnesses.

Method: This study, conducted using a pre-test post-test experimental design with experimental and control groups, involved 461 physicians from 95 Family Health Centers in Kayseri, Turkey. Both experimental and control groups were administered pre-tests, followed by online mental health training for the experimental group, and then post-tests were conducted. Data were collected using the "Personal Information Form," "Mental Health Literacy Scale," "Beliefs toward Mental Illness Scale," and "Community Attitudes toward the Mentally Ill Scale."

Results: Data from 184 physicians were analyzed, the educational intervention significantly improved mental health knowledge (p=0.032), help-seeking adequacy (p=0.043), and positive attitudes (p=0.032), while reducing perceptions of danger (p=0.043) among the intervention group. The study indicated significant enhancements in mental health knowledge and help-seeking adequacy among primary care physicians in Turkey following online mental health literacy education. However, its impact on beliefs and attitudes towards mental illness is comparatively modest. Further research is necessary for a deeper analysis of the relationships between these dimensions.

Discussion: Mental health literacy education positively influences primary care physicians' knowledge and help-seeking behaviors regarding mental illnesses, although it has a relatively modest impact on their beliefs and attitudes. There is a need for further research to conduct a more in-depth analysis of the relationships between the dimensions of beliefs and attitudes towards mental illnesses in mental health literacy education.

Key Words: Mental Health, Primary Health Care, Community Health, Family Physician, Preventive Medicine.

INTRODUCTION

Mental health problems continue to be prevalent worldwide. The World Health Organization (WHO) emphasizes that, without mental health, there can be neither health nor sustainable development, asserting that investing in mental health is an investment in humanity (1). Contemporary economic downturns, humanitarian crises, poverty, conflict, forced displacement, natural disasters, escalating climate crises, violence and social inequalities are predicted to continue to pose threats to mental health in the future. These various interactive biopsychosocial factors range from societal stressors to individual factors, such as low self-esteem and collectively weakening mental health (2). The increasing prevalence of mental health disorders has serious consequences, including significant personal burdens, reduced quality of life, human rights violations, stigmatization and discrimination, poverty, decreased productivity, physical health problems, and premature death, affecting both the individuals and their families (3). This situation leads to an expanding treatment gap for mental health issues, with one of the main reasons being low levels of mental health literacy (MHL) (4).

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The MHL can be defined as an individual's competence in understanding, recognizing, and managing mental illnesses. In 2012, this concept also encompassed the ability to provide support to individuals experiencing mental health issues and knowing where to seek professional help4. MHL is generally considered a crucial element in enhancing the mental health and well-being of individuals and communities. Numerous recent studies have shown a relationship between low mental health literacy and adverse health outcomes (5,6). Developments in mental health literacy have conclusively been demonstrated to improve the recognition of mental illnesses in society and enhance knowledge, attitudes, and intended behaviors towards individuals with mental illnesses (7,8).

Increasing services for individuals identified as needing mental health care are reported to be best achieved through the provision of mental health services in primary care (9). Primary care services are expected to provide initial contact for individuals and demonstrate the capacity to offer comprehensive, continuous, and coordinated services to those with health problems while also having the ability to quickly refer to higher levels of care. However, this expectation is often not met in the majority of low-income and middle-income countries within the scope of primary healthcare services (9,10). The reasons for this include inadequate training of primary healthcare workers, stigma, insufficient recognition, and inappropriate treatment of mental health conditions as well as reported issues of resource and funding shortages (11,12,13).

Numerous studies have indicated that primary healthcare personnel have insufficient knowledge about mental health (2,14), experience stigma (15) and have various attitudes and skill gaps (12,16,17). However, there are still ongoing knowledge gaps in this subject (11,13,18). Although family physicians play a crucial role in the early detection and treatment of mental health problems in individuals and family members (19), no study has been conducted to determine the mental health literacy levels of family physicians working in primary healthcare services in Turkey.

Family physicians in primary care should inform individuals about their mental health, identify mental disorders and guide users to appropriate services. Unfortunately, health personnel working in primary care often report insufficient knowledge to identify and manage mental health issues and express the need for specific professional training (12,20). Given the geographical and cultural diversity of Turkey, individuals' beliefs may vary and these beliefs can be specific to certain cultures. These strong cultural beliefs and traditional perspectives can influence family physicians' views on mental disorders (11,21), subsequently affecting their beliefs and attitudes towards mental illnesses.

This study aims to contribute to our understanding of family physicians' perspectives on mental health services and to evaluate the impact of education on their mental health literacy, beliefs, and attitudes.

To evaluate the effects of mental health literacy education on stigma-related beliefs and attitudes, the following hypotheses were formulated:

1-Family physicians who receive online mental health literacy education will show a significant increase in their awareness of mental health issues.

2-Family physicians who undergo online mental health literacy education exhibit a decrease in negative beliefs and attitudes towards mental illnesses.

METHODS

This study was a two-arm, parallel-group, single-blind randomized controlled trial (RCT). The results of this study are reported in accordance with the CONSORT 2010 statement (22).

Participants

The population of this study was 461 general practitioner family physicians (FPs) working in 95 Family Health Centers in Kayseri Province. The sample size of the study was calculated using G-power analysis, and 92 participants in each group were considered sufficient. FPs consenting to the

study and meeting the inclusion criteria were randomly allocated to the intervention and control groups based on the sequence number of the list in the Provincial Directorate of Health Records. In the Excel file prepared by the Provincial Directorate of Health for FPs, it was observed that the rural/urban and regional order was quite clear and organized. Computer-assisted randomization was performed to ensure blinding in determining the groups.

The inclusion criteria were as follows.

1-Being a general practitioner FP in Kayseri Province.

2- Having the infrastructure to access online education during teaching hours

3- Attending at least 90% of the education program

4- Consenting to participate in the research.

There were no age or sex restrictions in this study.

The exclusion criteria were as follows.

1. Refusing to participate in education and surveys for research purposes.

2. Having missed more than 10% of the education program

3. Being a Specialist FP.

The sample size for each group was determined to be 135 individuals to ensure adequacy of the sample size with the inclusion of intervention in the study and to maintain it during the retest process. In the post-hoc power analysis conducted with G Power 3.1.9.7, the statistical test was set as correlation, effect size was 0.5 and α was 0.05, resulting in a study power (1- β) of 0.95.

Place and time of the research

The pre- and post-surveys were sent to the workplaces of the FPs through institutional mail between August 2022 and June 2023 and were likewise collected. The educational intervention was conducted through an online platform in March 2023.

Measurement Tools Used in the Study

Personal Information Form: The questionnaire was prepared by the researchers for this study by reviewing the literature (11). It consisted of 21 personal and professional information questions.

Mental Health Literacy Scale (MHLS): Developed by Jung (23) in 2016 and translated and validated in Turkish by Göktaş et al. in 2019 (24). The MHLS comprises 22 items and is divided into three subscales: knowledge of signs and symptoms of MH illness (MHLS-1)(items 1–10), MH beliefs (MHLS-2) (items 11–18) and knowledge of MH resource (MHLS-3)(items 19–22). The scores on the scale ranged from 0 to 22. The first two sub-dimensions, consisting of 18 6-point Likert type questions questions, with response options such as "strongly agree, agree, undecided, disagree, strongly disagree, don't know." Responses to the 4 questions in knowledge of resources of MH sub-dimension items have the answer options "yes" and "no." Choosing "strongly agree," "agree," or "yes" results in a score of "1 point," while other responses are assessed as "0 points." Items between the 11th and 18th percentiles were reverse-coded. As the scores obtained from the MHLS increased, this indicated that the individual had a higher level of mental health literacy.

The Beliefs Toward Mental Illness Scale (BMI): In order to measure participants' stigma, the 'Beliefs Toward Mental Illness Scale' (BMI) was administered. BMI was developed by Hirai and Clum in 2000 (25) and the Turkish version was validated by Bilge and Çam in 2008 (26). The BMI is a 21-item measure designed to evaluate negative stereotypical perceptions of psychological disorders and is categorized into three subscales. Dangerousness (BMI-1) (eight items): An individual with a mental illness is more likely to harm others than a healthy individual. Incurability and Social Dysfunction (BMI-2) (11 items): This factor examined attitudes regarding the social functioning of people with mental illness, including perceptions of their relia-

bility in work environments, punctuality, ability to live independently, beliefs regarding the chronic and incurable nature of mental illnesses, encompassing ideas of recurrence, lifelong impact, and prolonged treatment requirements. Embarrassment (BMI-3) (two items): This factor investigates feelings of embarrassment or stigma linked to mental illness, particularly concerning the individual or their family members who are diagnosed with a psychological disorder.

Each item is scored on a 6-point Likert-type scale ranging from 0 (completely disagree) to 5 (completely agree). Higher total scale and subscale scores indicate a greater degree of stigma toward psychological disorders.

Community Attitudes Toward Mental Health Scale (CAMI): Developed by Taylor and Dear in 1981 (27), the Turkish version validated by Bağ and Ekinci in 2006 (28). It consists of 21 items across three subscales: fear/exclusion (CAMI-3), Community Mental Health Ideology (CAMI-2) and goodwill (CAMI-1). Higher total scores on the CAMI-1 and CAMI-2 Ideology subscales reflect a positive attitude, whereas a higher total score on the CAMI-3 subscale indicates a negative attitude.

Presentation of the educational content

The educational content was developed by the faculty members of Erciyes University Faculty of Medicine, Department of Psychiatry, Department of Public Health and Department of Medical Education. The short educational program included the following subjects: "Mental illnesses in primary care; Recognition, evaluation and differentiation of psychiatric diseases; Psychiatric emergencies and critical situations; Coping with stress and stress management for health personnel".

The online education platform link address and content were shared one day before the education through the communication channels reported by those willing to participate in the study for presentation of the educational content prepared for the intervention group. The educational programs were implemented online. The program was conducted in four sessions on the same day. Each educational content session lasted for 35 minutes on average. Chat and WhatsApp groups were used to allow the audience to ask questions during the online lecture. A 10-minute break was given after each session. The program was implemented on weekends, outside of working hours.

Statistical assessment

The independent statistical support was obtained for the analysis of the research results to ensure blinding in the analyses. Frequencies and percentages were used to present data on demographic variables and the chi-square test or Fisher's exact test was used to determine the differences between independent variables. The answers given to the pre- and post-test scale items used in the study did not conform to a normal distribution ($p<0.05$). Mann-Whitney U test was used to compare differences between groups for continuous variables. Wilcoxon Paired Two-Sample Test was used for the pre- and post-test analysis of dependent variables. Spearman's test was used to assess the relationship between the scale scores. The results were considered significant at a 95% confidence interval and $P<0.05$. The results were analyzed using SPSS, version 25.0 (SPSS Inc., Chicago, IL, USA).

Ethical Considerations

The study was conducted in accordance with the World Medical Association Declaration of Helsinki. Permission was obtained with the decision of Erciyes University Clinical Research Ethics Committee dated 06.10.2021 and numbered 2021/643. This study was derived from the doctoral thesis titled "Mental Health Literacy and Virtual Training Program Pilot Study in Primary Care Health Workers". The clinical trial was registered with the number ACTRN12622001223729.

RESULTS

This study included 461 family physicians. As 46 family physicians did not meet the inclusion criteria and 145 family physicians declined participation, 270 individuals were randomized. Figure 1 illustrates the numerical dynamics of participants du-

Table 1. Demographic characteristics at baseline

	Control group (n=93)		Educational group (n=91)		Total (n=184)		t or x^2	*p*
Age – SS	50,04 – 6,68		47,91 – 7,87		48,98 – 7,35		t=1,981	p=0,063
Professional Year – SS	25,09 – 6,73		22,69 – 7,84		23,90 – 7,38		t=2,231	p=0,057
	n	%	n	%	n	%		
Gender								
Male	68	73,1	53	58,2	121	65,8	x^2=4,521	p=0,330
Female	25	26,9	38	41,8	63	34,2		
Marital status								
Married	82	88,2	83	91,2	165	89,7	x^2=0,458	p=0,499
Not married	11	11,8	8	8,8	19	10,3		
Family Type								
Nuclear family	77	82,8	83	91,2	160	86,9		
Extended family	6	6,5	5	5,5	11	6,0	x^2=4,064	p=0,131*
Alone	10	10,7	3	3,3	13	7,1		
Income status								
Income = expense	45	48,4	44	48,4	89	48,4		
Income <expense	21	22,6	21	23,1	42	22,8	x^2=0,008	p=0,996
Income > expense	27	29,0	26	28,5	53	28,8		
The situation of having mental health problems in the past								
Have	22	23,7	23	25,3	45	24,5	x^2=1,117	p=0,572
Have not	71	76,3	68	74,7	139	75,5		
The state of being a relative diagnosed with a mental illness								
Have	22	23,7	30	33,0	52	28,3	x^2=1,967	p=0,161
Have not	71	76,3	61	67,0	132	71,7		
The status of receiving primary care mental health education after graduation								
Yes	51	54,8	45	49,5	96	52,2	x^2=0,535	p=0,464
No	42	45,2	46	50,5	88	47,8		
The state of considering preventive mental health services as a duty								
My duty	63	67,7	68	74,7	131	71,2		
Not my duty	2	2,2	1	1,1	3	1,6	x^2=3,768	p=0,438*
I doubt it	28	30,2	22	24,2	50	27,2		
Location of the family health center (FHC)								
Urban FHC	90	96,8	81	89,0	171	92,9	x^2=4,222	p=0,470*
Rural FHC	3	3,2	10	11,0	13	7,1		

*Fisher s exact test.

ring the study period. The mean age of participating family physicians was 48.98±7.35 (control: 50.04±6.68 and intervention: 47.91±7.87), with mean years of professional experience being 23.90±7.38 (control: 25.09±6.3 and intervention: 22.69±7.84). Of the participants, 65.8% were male (control: 73.1% and intervention: 58.2%) and 92.9% (control: 96.8% and intervention: 89.0%) worked in provincial primary healthcare centers. Other demographic characteristics of the included physicians are presented in Table 1. Homogeneity of distribution between the control and intervention groups of the included family physicians was established ($p > 0.05$; Table 1). In this study, 91 family physicians in the intervention group and 93 in the control group underwent the final test (Figure 1).

Among the participating family physicians, 52.2% reported having received postgraduate education on mental health (control: 54.8% and intervention: 49.5%). 71.2% stated that they had responsibilities for preventive mental health services among primary healthcare services (control: 67.7% and intervention: 74.7%) (Table 1).

The pre-test scale scores of the intervention and control groups were homogeneously distributed before the intervention, indicating comparability for the research ($p > .05$)(Table 2). The group post-test scale scores are compared in Table 2. Among the scales used in the study, the MHLS comprises three subscales: knowledge about mental illnesses, beliefs and help-seeking behaviors. The intervention group exhibited significant increases compared to the control group in subscales indicating knowledge about mental illnesses and help-seeking behaviors. BMI comprises three subscales: perceived danger, perceived uncontrollability and perceived stigma in interpersonal relationships. Table 2 indicates that there was a decrease in perceived uncontrollability/perceived stigma in personal relationships and in total BMI scores in the intervention group compared with the control group. However, no difference was observed between the control and intervention groups in the other two subscales of the BMI. CAMI is comprised of three subscales: benevolence, mental health ideology and social restrictiveness/fear. As shown in Table 2, only the fear score of physicians in the intervention group was significantly lower than that in the control group.

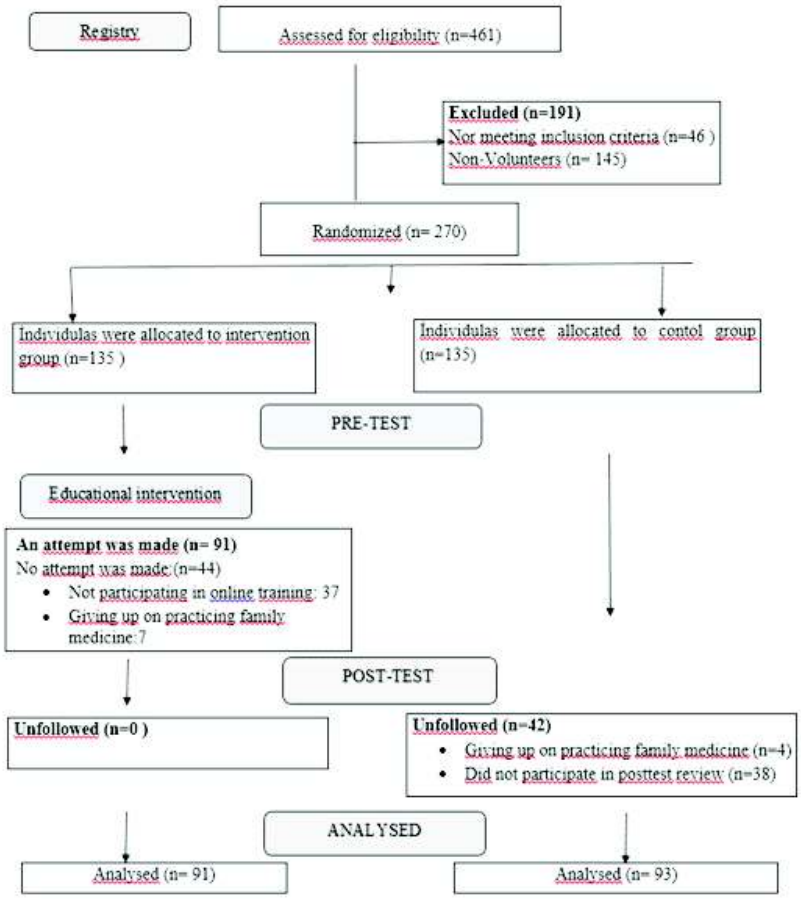

Figure 1. CONSORT 2010 flowchart.

In light of these findings, it was determined that physicians who received mental health literacy education had increased awareness of mental illnesses and help-seeking behavior compared to the control group and that fear and communication problems in relationships with individuals with mental health problems decreased.

Table 3 presents the results of the Wilcoxon signed-rank test analysis comparing the pre- and post-test scores of the physicians in the intervention group. The results revealed that the intervention significantly increased MHLS and all of its subscales' scores (MHLS (p=0.05), MHL-1 (p=0.01), MHL-2 (p=0.01) and MHL-3 (p= 0.01)). Additionally, the educational intervention was found to be effective in the three subscales of the CAMI ($p < 0.05$). Educational intervention did not affect the BMI and its subscales.

The Wilcoxon signed-rank test was used to compare the pre- and post-test results for the control group (Table 4). The analysis found an increase in the mental health knowledge level compared with the pre-test results for the control group. However, no changes were observed in BMI and CAMI scores ($P > 0.05$).

The results indicate that after the educational program, physicians' awareness of and intention to seek help for mental illnesses increased and fear attitudes towards mental illnes decreased. Our study findings demonstrate that the importance of mental health for the individuals and the community cared for by family physicians, as well as supportive communication attitudes, have increased. For physicians who did not receive the educational intervention, awareness of mental illnesses increased after the pre-test.

MHLS, BMI, and CAMI pre-test and post-test scores were subjected to Mann-Whitney U and Kruskal-Wallis tests for demographic factors, such as age, gender, marital status, family type, income

Table 2. Comparison of pre-test/ post-test scales and subscale scores of FPs in the control and experimental group

Scale	Group	Pre-test					Post-test				
		N	Mean Rank	Median (Min-max)	u	p	N	Mean Rank	Median (Min-max)	u	p
MHLS	Control	93	97,44	15(10-22)	3772,5	0,202	93	81,74	17(11-22)	3231	0,005*
	Experimental	91	87,46	15(6-22)			91	103,49	19(14-22)		
MHLS-1	Control	93	97,8	6(5-9)	3739	0,158	93	88,2	7(4-10)	3832	0,209
	Experimental	91	87,09	9(3-10)			91	96,89	10(6-10)		
MHLS-2	Control	93	98,92	5(2-8)	3634	0,086	93	85,04	6(2-8)	3537,5	0,049*
	Experimental	91	85,93	4(2-8)			91	100,13	6(3-8)		
MHLS-3	Control	93	99,22	2(1-4)	3606,5	0,071	93	85,77	2(1-4)	3605,5	0,044*
	Experimental	91	85,63	2(1-4)			91	99,38	3(1-4)		
BMI	Control	93	92,66	43(5-84)	4217	0,968	93	100,21	46(19-70)	3514,5	0,047*
	Experimental	91	92,34	43(9-95)			91	84,62	41(5-73)		
BMI-1	Control	93	93,13	19(3-37)	4173	0,871	93	97,02	20(5-30)	3811	0,244
	Experimental	91	91,86	18(4-34)			91	87,88	17(3-34)		
BMI-2	Control	93	94,62	23(5-52)	4034	0,584	93	103,1	26(4-38)	3245,5	0,006*
	Experimental	91	90,33	21(8-55)			91	81,66	19(7-43)		
BMI-3	Control	93	90,81	3(1-10)	4074,5	0,651	93	90,2	2(1-6)	4017,5	0,537
	Experimental	91	94,23	2(1-10)			91	94,85	1(1-9)		
CAMI	Control	93	97,18	51(13-83)	3796,5	0,228	93	97,02	53(33-81)	3811,5	0,244
	Experimental	91	87,72	49(6-83)			91	87,88	52(37-82)		
CAMI-1	Control	93	94,98	21(13-33)	4000,5	0,521	93	91,28	23(13-33)	4118	0,752
	Experimental	91	89,96	21(9-34)			91	93,75	23(15-34)		
CAMI-2	Control	93	98,12	23(10-40)	3708,5	0,147	93	94,52	21(4-30)	1351	0,001*
	Experimental	91	86,75	22(10-40)			91	76,1	23(13-44)		
CAMI-3	Control	93	87,52	7(4-10)	3768,5	0,187	93	97,47	8(4-39)	1811,5	0244
	Experimental	91	97,59	7(5-16)			91	80,85	6(3-10)		

*p<0,05 / Mann-Whitney U Test. MHLS: Mental Health Literacy Scale(MHLS -1. Knowledge, MHLS -2: Belief, MHLS-3: Resource); B MI: The Beliefs Toward Mental Illness scale (BMI -1: Dangerousness, BMI -2: Incurability and Social Dysfunction, BMI -3: Embarrassment); CAMI: Community Attitudes Toward Mental Health Scale (CAMI -1: Goodwill, CAMI-2: Community Mental Health Ideology, CAMI-3: Fear/Exclusion)

level, years of professional experience, working in rural or urban primary care facilities, receiving postgraduate mental health education, being close to a individual with mental illness, experiencing a mental illness, and considering preventive mental health services as part of their duty.

To understand the relationship between the post-test scores of all MHLS, BMI and CAMI subscales for physicians who received mental health literacy education, Spearman's correlation coefficients were calculated (Table 5). According to the analysis, there was a positive and strong relationship between all the MHLS-1, MHLS-2 and MHLS-3 post-test scores. Additionally, a negative relationship was found between MHLS-1 and CAMI-3 scores. MHLS-3 had a strong negative relationship with BMI-2 and CAMI-3 post-test scores and a positive relationship with the CAMI-2 score.

These results indicate that as physicians' mental health knowledge increases, awareness of help-seeking behavior for individual with mental illness and attitudes towards treatability increase, and fear of mental patients and avoidance attitudes in communication decrease.

DISCUSSSION

This study examined how the mental health literacy education provided to primary care physicians affected their level of awareness of mental health issues and their beliefs and attitudes towards these conditions.

This study examined how mental health literacy education provided to primary care physicians affected their level of awareness of mental health issues and their beliefs and attitudes towards these conditions. Our findings support our first hypothesis. It was determined that the average scores for MHLS and all its sub-dimensions increased as a result of the education. Physicians in the intervention group showed increased knowledge of mental health, improved help-seeking behavior and supportive attitudes. Our results are consistent with existing literature on the effectiveness of educational interventions aimed at increasing mental health literacy among healthcare professionals. Previous studies have shown that educational interventions, including online courses, are effective in enhancing mental health literacy among healthcare professionals (29, 30). Griffiths et al. (2016) reported in their meta-analysis that an online mental health education program significantly increased medical students' mental health knowledge and confidence in coping with mental health issues

Table 3. Experimental Group's Pre-test vs. Post-test Scores Comparison via Wilcoxon Signed-Rank Test

Parameters	Ranks	N	Mean Rank	Sum of Ranks	Z	p
Pre-MHLS /	(-)	0	0	0		
Post -MHLS	(+)	87	44	3828	-8,114	
	=	4				,001*
Pre-MHLS-1 /	(-)	0	0	0		
Post-MHLS-1	(+)	57	29	1653	-6,718	
	=	34				,001*
Pre-MHLS-2 /	(-)	0	0	0		
Post-MHLS-2	(+)	67	34	2278	-7,162	
	=	24				,001*
Pre-MHLS-3 /	(-)	0	0	0		
Post-MHLS-3	(+)	57	29	1653	-6,706	
	=	34				,001*
Pre-BMI /	(-)	50	50,32	2516		
Post-BMI	(+)	41	40,73	1670	-1,675	
	=	0				,094
Pre-BMI-1 /	(-)	48	42,55	2042,5		
Post-BMI-1	(+)	39	45,78	1785,5	-,544	
	=	4				,586
Pre-BMI-2 /	(-)	50	47,28	2364		
Post-BMI-2	(+)	37	39,57	1464	-1,906	
	=	4				,057
Pre-BMI-3 /	(-)	36	39,51	1422,5		
Post-BMI-3	(+)	36	33,49	1205,5	-0,613	
	=	19				,541
Pre-CAMI /	(-)	30	39,57	1187		
Post- CAMI	(+)	56	45,61	2554	-2,945	
	=	5				,003*
Pre-CAMI-1	(-)	26	37,1	964,5		
Post-CAMI-1	(+)	58	44,92	2605,5	-3,668	
	=	7				,001*
Pre-CAMI-2	(-)	35	40,2	1407		
Post-CAMI-2	(+)	51	45,76	2334	-1,998	
	=	5				,046*
Pre-CAMI-3	(-)	45	41,94	1887,5		
Post-CAMI-3	(+)	29	30,6	887,5	-2,724	
	=	17				,006*

*P<0,05. MHLS: Mental Health Literacy Scale(MHLS-1. Knowledge, MHLS-2: Belief, MHLS-3: Resource); BMI: The Beliefs Toward Mental Illness scale (BMI-1: Dangerousness, BMI-2:Incurability and Social Dysfunction, BMI-3: Embarrassment); CAMI: Community Attitudes Toward Mental Health Scale (CAMI-1: Goodwill, CAMI-2: Community Mental Health Ideology, CAMI-3: Fear/Exclusion)

(29). Similarly, Henderson et al. (2018) reported that educational interventions increased healthcare workers' confidence in recognizing and managing mental health disorders (30).

Our research findings partially support our second hypothesis. It was determined that there is a difference between the pre-test and post-test scores of the total BMI ($p=0.034$) and the dangerousness sub-dimension ($p=0.046$) of the family physicians in the intervention group, while the differences in other sub-dimensions were not significant ($p>0.05$). According to the post-test results of the CAMI scale, changes were observed in the total scale score ($p=0.003$) and in the sub-dimensions of benevolence ($p=0.001$) and fear ($p=0.006$) among the family physicians in the intervention group. Despite an increase in the score of the ideology sub-dimension ($p=0.056$), it was determined that the education did not have a sufficient impact ($p>0.05$). According to the literature, pre-test results indicated that family physicians had more negative attitudes in the dangerousness sub-dimension compared to others and it is noteworthy that the effect of the training was most pronounced in the dangerousness sub-dimension. Similarly, according to the RSTTÖ pre-test results, "fear" was the highest-scoring sub-dimension. However, the positive change in the dimensions of "benevolence" and "fear" after the training indicates that the education was particularly effective in changing the perceptions of danger and fear among family physicians. Family physicians usually deal with a wide range of health conditions and provide extensive counseling to their patients; therefore, shaping their attitudes and perceptions through education can have significant effects on the quality of patient care. Our study found that the educational intervention was effective in addressing negative beliefs and societal attitudes toward mental health issues, although there are aspects that need improvement.

The positive and strong correlations found between the MHLS and its subscales in the study indicate that the training has holistically enhanced physicians' overall knowledge of mental health. The negative relationship between MHLS-1 and CAMI-3 scores suggests that physicians with greater know-

Tablo 4. Control Group's Pre-test vs. Post-test Scores Comparison via Wilcoxon Signed-Rank Test

Parameters	Ranks	N	Mean Rank	Sum of Ranks	Z	p
Pre-MHLS / Post -MHLS	(-)	3	32,32	808	-4999	,041*
	(+)	25	50,57	3287		
	=	65				
Pre-MHLS-1 / Post-MHLS-1	(-)	26	24,58	639	-.230	.023*
	(+)	42	27,48	687		
	=	25				
Pre-MHLS-2 / Post-MHLS-2	(-)	16	22,19	355	-5668	,071
	(+)	18	42,29	2495		
	=	59				
Pre-MHLS-3 / Post-MHLS-3	(-)	27	26,61	718,5	-2018	.064
	(+)	36	36,04	1297,5		
	=	30				
Pre-BMI / Post-BMI	(-)	43	45,42	1953	-.380	.704
	(+)	47	45,57	2142		
	=	3				
Pre-BMI-1 / Post-BMI-1	(-)	39	43,97	1715	-.493	.622
	(+)	46	42,17	1940		
	=	8				
Pre-BMI-2 / Post-BMI-2	(-)	44	39,88	1754,5	-.676	.499
	(+)	43	48,22	2073,5		
	=	6				
Pre-BMI-3 / Post-BMI-3	(-)	35	31,89	1116	-.744	.457
	(+)	28	32,14	900		
	=	30				
Pre-CAMI / Post- CAMI	(-)	6	5	30	-.706	.484
	(+)	6	8	48		
	=	81				
Pre-CAMI-1 Post-CAMI-1	(-)	7	4,29	30	-.267	.789
	(+)	4	9	36		
	=	82				
Pre-CAMI-2 Post-CAMI-2	(-)	4	5,5	22	-1645	.100
	(+)	9	7,67	69		
	=	80				
Pre-CAMI-3 Post-CAMI-3	(-)	7	5,43	38	-1081	.281
	(+)	3	5,67	17	,28	
	=	83				

*P<0,05, MHLS: Mental Health Literacy Scale(MHLS-1. Knowledge, MHLS-2: Belief, MHLS-3: Resource); BMI: The Beliefs Toward Mental Illness scale (BMI-1: Dangerousness, BMI-2: Incurability and Social Dysfunction, BMI-3: Embarrassment); CAMI: Community Attitudes Toward Mental Health Scale (CAMI-1: Goodwill, CAMI-2: Community Mental Health Ideology, CAMI-3: Fear/Exclusion)

ledge are less likely to hold prejudices and stigmatizing attitudes towards individuals with mental health problems. Similarly, the strong negative correlation between MHLS-3 and both BMI-2 and CAMI-3 scores indicates that increased knowledge reduces fear and avoidance behaviors towards individuals with mental health issues. On the other hand, the positive relationship between MHLS-3 and CAMI-2 suggests that there is an increase in positive attitudes toward the treatability of these individuals. These findings demonstrate that mental health literacy education not only enhances knowledge levels but also enables physicians to integrate this knowledge into their clinical practices, fostering more informed and empathetic approaches toward mental health issues. The results suggest that such educational programs may play a significant role in improving the quality of mental health services. No other study in the literature has been found that evaluates all three

Tablo 5. Correlation between MHLS, BMI, and CATMHS Sub-dimensions Post-Test Scores with MHLS Training.

		MHLS-1	MHLS-2	MHLS-3	BMI-1	BMI-2	BMI-3	CAMI-1	CAMI-2	CAMI-3
MHLS-1	r	-	,315**	,260**	0,129	0,141	-0,125	-0,067	0,07	-,173*
MHLS-2	r	-	-	0,056	0,046	0,046	-0,053	0,121	-0,017	-0,091
MHLS-3	r	-	-	-	-0,112	-,296**	-0,084	0,04	,188*	-,223**
BMI-1	r	-	-	-	-	,475**	0,143	-0,047	-,207**	,281**
BMI-2	r	-	-	-	-	-	,525**	0,103	-,256**	,184*
BMI-3	r	-	-	-	-	-	-	,218**	-0,04	0,061
CAMI-1	r	-	-	-	-	-	-	-	-0,025	0,059
CAMI-2	r	-	-	-	-	-	-	-	-	-,601**
CAMI-3	r	-	-	-	-	-	-	-	-	-

Spearman s rho correlation test.** p<0,01, * p<0,05
MHLS: Mental Health Literacy Scale(MHLS-1. Knowledge, MHLS-2: Belief, MHLS-3: Resource); BMI: The Beliefs Toward Mental Illness scale (BMI-1: Dangerousness, BMI-2: Incurability and Social Dysfunction, BMI-3: Embarrassment); CAMI: Community Attitudes Toward Mental Health Scale (CAMI-1: Goodwill, CAMI-2: Community Mental Health Ideology, CAMI-3: Fear/Exclusion)

scales together. However, in a study by Fleary et al. (2022), the relationship between health literacy and beliefs and attitudes towards mental illnesses was investigated, and similar to our findings, a higher level of education was associated with lower stigmatization and increased mental health help-seeking behavior (31). According to the results of a study by Koutra et al. (2024), which used various scales to examine the relationship between mental health literacy (MHL) levels, stigma and help-seeking behavior, individuals with higher MHL levels exhibit more positive attitudes towards mental illness and show lower levels of self-stigma related to seeking help (32).

The literature shows varying results on the effectiveness of anti-stigma education. Some research findings support our study by indicating the positive impact of mental health education on reducing stigma. Most studies targeting physicians have been conducted on medical students. These studies highlight that students exhibit more positive attitudes following psychiatric education and internships (33, 34, 35). A meta-analysis by Mehta et al. (2015) reported that different types of interventions are effective in reducing stigma and discrimination related to mental health (36). Similarly, a study by Reavley et al. (2014) indicated that mental health literacy is associated with reduced stigmatizing attitudes toward individuals with mental illness (37). Conversely, some studies have found no significant impact of education on stigma, suggesting that psychiatric education alone is insufficient to improve medical students' attitudes towards mental health patients, and there are no differences in stigmatizing attitudes between those who received psychiatric education and those who did not (38, 39, 40).

Anti-stigma education can be an important tool in improving societal perceptions of mental health issues and combating stigmatization. To be effective, these educational interventions should be implemented with a long-term and comprehensive strategy. A systematic review by Gronholm et al. (2017) showed that short-term educational interventions have small to moderate effects, similar to our findings (41). Mehta et al. (2015) mentioned various approaches to reducing stigma, including educational programs, social campaigns, media campaigns, and contact-based education, with contact-based education being particularly effective in reducing stigma and discrimination by enhancing interpersonal communication (36). The online education program used in our study was not face-to-face and did not involve contact-based education. To achieve the desired effectiveness in reducing stigma scores, it may be beneficial to evaluate another face-to-face education program, which could contribute to educational and program development efforts.

The research was conducted with those who agreed to participate, which may have led to the participation of individuals with more positive attitudes towards mental illnesses, particularly concerning beliefs and attitudes towards society. The study was limited to the results of the MHLS, CAMI and BMI scales, as well as their sub-dimensions. As a sample education model was not implemented in Turkey, the education was designed as a pilot study. As education is conducted online, the quality of listening among the participants may vary.

In conclusion, our study demonstrates that the mental health education intervention used has the potential to increase the level of mental health literacy, reduce negative beliefs and attitudes, but the decrease in belief and attitude levels is limited, indicating a need for additional interventions and further studies to achieve better results.

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