



Impact of bariatric and metabolic surgery education program on the knowledge and attitude of medical students

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ABSTRACT

Objective: Bariatric and metabolic surgery (BMS) is the most effective treatment method of morbid obesity. Optimum education of medical students regarding BMS is important for proper assessment of morbidly obese patients in the future.

Material and Methods: Medical students from five and six years were determined as the targeted study population. A survey including 17 questions was applied through a web-based survey platform. Students who replied the survey were classified into two groups: distinct bariatric and metabolic surgery education program (BMSEP) (+) and (-). The answers of two groups were compared using Chi-square test.

Results: In total, 845 students replied the survey. Surgery referral rates were higher (33.4% vs. 26.5%, $p < 0.05$), referring to alternative treatment methods were low (4.9% vs. 11.9%, $p < 0.05$), the answer rate of "absolutely agree" was higher and "have no idea" was lower in questions regarding the indications of BMS for the sample patient with body mass index (BMI) $> 40 \text{ kg/m}^2$ and the sample patient with BMI between $35\text{-}40 \text{ kg/m}^2$ in the BMSEP (+) group ($p < 0.05$). However, the two groups were comparable for the answers given for the sample patient of BMI $30\text{-}35 \text{ kg/m}^2$ with uncontrolled diabetes. The rate of first-degree relative referral to BMS when indicated was higher in the BMSEP (+) group. Effectiveness of surgery, cost and risk perception were comparable between the two groups.

Conclusion: This study showed that medical students who have a distinct BMSEP in their medical school have better level of knowledge and comparable risk perception regarding BMS. Structured education programs in BMS may directly improve knowledge, perception, and attitude of medical students and indirectly increase the role of primary care physicians in patient referral to BMS and long-term follow-up.

Keywords: Medical education, morbid obesity, bariatric surgery, medical student

INTRODUCTION

Multidisciplinary and staged approach is necessary in the treatment of morbid obesity. Bariatric surgery is the most effective treatment modality for morbidly obese patients, and it has been widely utilized. Bariatric procedures are successful in treating metabolic problems secondary to obesity, and lately the reported mortality rate is 0.18% (1,2). Nevertheless, medical society is biased despite of the advantages of bariatric surgery. Thus, bariatric surgery may not be offered as an option to the patients who may potentially benefit (3). Primary care physician (PCP) referral increases the bariatric surgery acceptance rate in morbidly obese patients (4). In a previously published study from our center, it has been shown that the referral rate of morbidly obese patients to bariatric surgery is higher among primary care physicians (PCPs) who are in the early period of their career (5).

Optimum education for medical students regarding the treatment of obesity and bariatric surgery is an important factor affecting their future perspective. Various studies have reported that the curriculum for obesity and its treatment in several medical schools is inadequate (6). A survey study investigating medical education regarding obesity and its treatment in the United States has concluded that only 10% of the program directors reported their curriculum as sufficient (7). According to the same study, one third of medical schools do not have obesity medicine in their current curriculum and do not have a plan on adding it. Another survey study evaluating the evolution of medical knowledge in medical students from the first year to the fourth year has shown that despite the significant improvement in

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knowledge, 60% of the medical students do not identify obesity as a disease (8). Interestingly, there are limited studies evaluating the curriculum for bariatric surgery and perspective of medical students regarding bariatric procedures (9).

In our country, education in obesity medicine should fill the following criteria according to the National Medical Education Core Program (UTCEP): A PCP should have adequate knowledge in diagnosis and treatment options, refer to a specialist after performing preliminary physical examination and tests, perform long term follow up, and employ disease prevention and control measures. Most of the medical schools configure their curriculum based on these criteria. However, there is no recommendation for implementing bariatric and metabolic surgery (BMS) as a distinct education program in UTCEP, it is left to the self-initiative of the medical schools (10).

There is no published study investigating the level of knowledge regarding obesity and BMS among the medical doctors who graduated from medical schools where BMS is a distinct education program in the curriculum. In this survey study including medical students from years five and six, it was aimed to compare the knowledge levels and perspectives of medical students in BMS and whether or not they had BMS as distinct education program in the medical school.

MATERIAL and METHODS

Survey Design

The target population of this study were medical students from years five and six in Türkiye since they were supposed to complete their basic training in obesity medicine. The survey was generated by an experienced bariatric surgeon (HO) after cautious review of the previously published similar articles and international guidelines. Then input of the executive council members of Turkish Society for Bariatric and Metabolic Surgery was obtained. After having tested the survey in a population consisting of 10 students, it was finalized comprising 17 questions that may be answered in three or four minutes. Survey questions consisted of informed consent (one question), presence of BMS education program (BMSEP) (one question), demographics (two questions), success of medical treatment (two questions), basic knowledge on surgery, indications, follow up, referral and education (11 questions). Demographics, practical approach, and requirement questions were multi choice and single answer while others were created in five points Likert's scale (absolutely disagree, disagree, have no idea, agree, absolutely agree). Survey questions are presented in appendix one. This study was approved by the institutional review board (2019-10/4).

Data Collection and Statistical Analysis

Based on the data obtained from the Turkish Council of Higher Education (YOK), there were 24.500 medical students from

years five and six in 2019. We aimed to query 800 students within a 95% confidence interval and a sampling error of 3%. The survey was performed via Survey Monkey Inc (San Mateo, California, USA). The web link of the survey was shared in social media, and answers were obtained from 845 students. The students were classified into two groups based on the presence of BMSEP in their medical school curriculum [BMSEP (+) and BMSEP (-)]. The distinction between these two groups was made according to the answer given to the question of whether there was BMSEP in addition to the obesity education program, independent of the content of the curriculum.

Two groups were compared with univariate analysis, chi-square and Fisher's exact tests were utilized. A p value lower than 0.05 was accepted statistically significant. Statistical analysis was performed using the software Survey Monkey Inc (San Mateo, California, USA).

RESULTS

In total, 845 students replied the survey. There were 85 medical schools in Türkiye during the study period. No students replied to the survey from 34 medical schools while there were 15 medical schools with more than 20 responders (Question 2). Of the medical students, 47% were year five and 53% were year six (Question 3). Obesity medicine and its treatment were included in the curriculum of all medical schools while BMSEP was present in only 36. Among the responders, 484 (57%) students had BMSEP in their curriculum (Question 4).

Majority of the students in both groups reflected diet, exercise and behavioral changes will not be adequate in the treatment of obesity, and the groups were comparable ($p=0.45$). The rate of referral to surgery for the patients who failed to lose weight with diet, exercise and behavioral changes was higher among the students who had BMSEP (33.4% vs 26.5%) and referral rate to alternative methods was lower in this group (4.9% vs 11%, $p=0.002$).

Answer "absolutely agree" was more frequent (27.5% vs 16.3%, $p=0.0001$) and "have no idea" was rare (10.9% vs 19.6%, $p=0.0003$) to the question regarding the sample patient with a body mass index (BMI) of >40 in the BMSEP (+) group. The answer for the question regarding the sample patient with comorbidity and BMI between 35 and 40 was similar to the previous question: BMSEP (+) group stated "absolutely agree" (25.4%) and "have no idea" (12.6%) while the BMSEP (-) group stated "absolutely agree" (17%) and "have no idea" (21%) (p values are 0.004 and 0.0006, respectively). However, the groups were comparable for the answer to the question uncontrolled diabetes mellitus (DM) with BMI between 30 and 35.

There were more students in the BMSEP (+) group who stated that surgical treatment was more efficient and would refer their first-degree relatives to surgery when indicated. Groups were comparable in terms of the "have no idea" answers regarding

surgical mortality rate. Additionally, the answers regarding “postoperative long-term follow-up of the patients may be done by the PCP” question were comparable. There was no difference between the groups among the subjects desired to be concentrated on during BMS training (Question 16). Students thinking that their education of BMS was adequate were more frequently found in the BMSEP (+) group. The answer “have no idea” was

rare and the answer “since they do not accept” was more frequent to the question “for what reason you may not recommend BMS to your relatives” in BMSEP (+) group. Two groups were comparable in terms of answers “not efficient”, “high cost” and “high risk”. However, risk perspective was high in two groups. Answers to the multi-choice questions are present in Figures 1, 2, 3 and to the Likert scale questions in Figure 4.

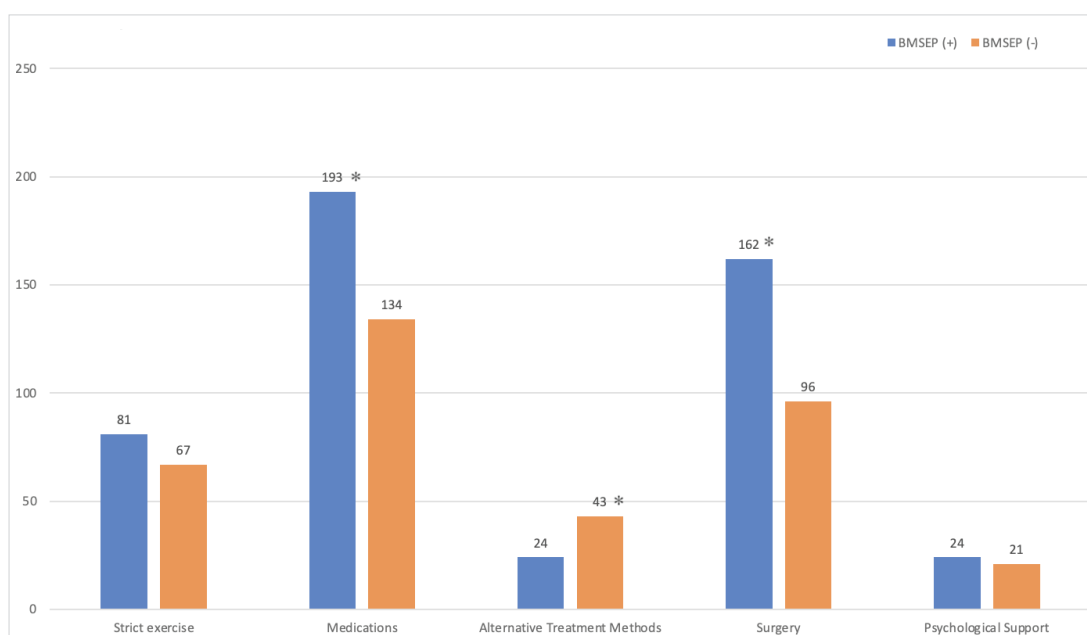


Figure 1. Answers to the question for the choice of treatment in patients who failed to lose weight with diet and exercise (Question 6). Surgery referral answer was more common while medical treatment and alternative treatment methods answers were rare among the students in BMEPS (+) group ($p < 0.001$).

(* shows the statistically significant differences between the groups)

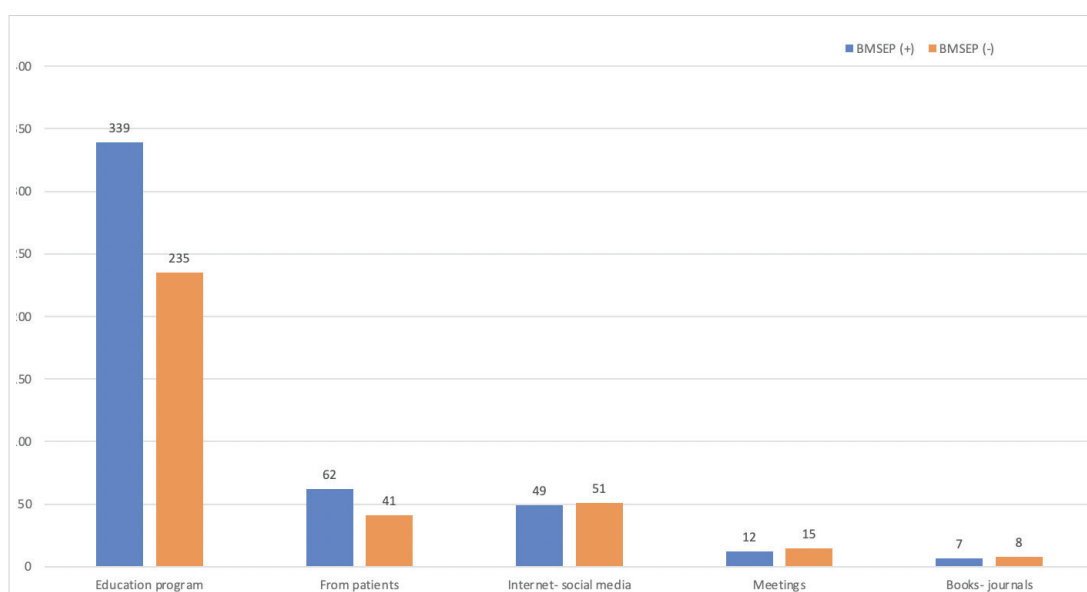


Figure 2. Responses to the question “How did you receive information on bariatric and metabolic surgery?” (Question 7). There were no significant differences between two groups ($p > 0.05$).

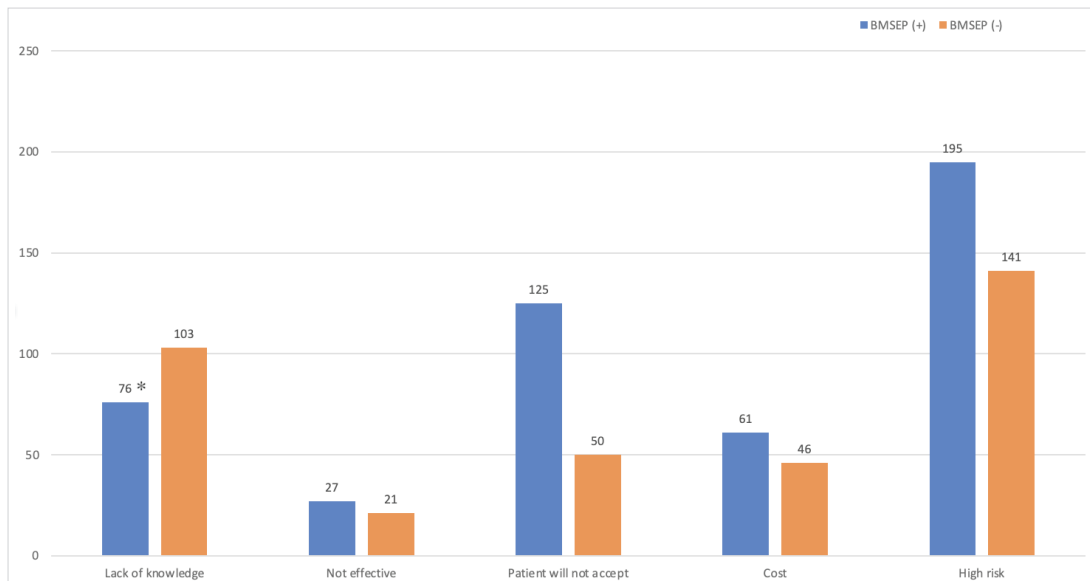


Figure 3. Responses to the question “When it is indicated, for what reason you may not recommend bariatric and metabolic surgery to your first-degree relatives? (Question 14). “Lack of knowledge” response rate was lower while “Patient will not accept” response rate was higher in BMSEP (+) group ($p < 0.001$). Risk perception was comparable between the groups. (* shows the statistically significant differences between the groups).

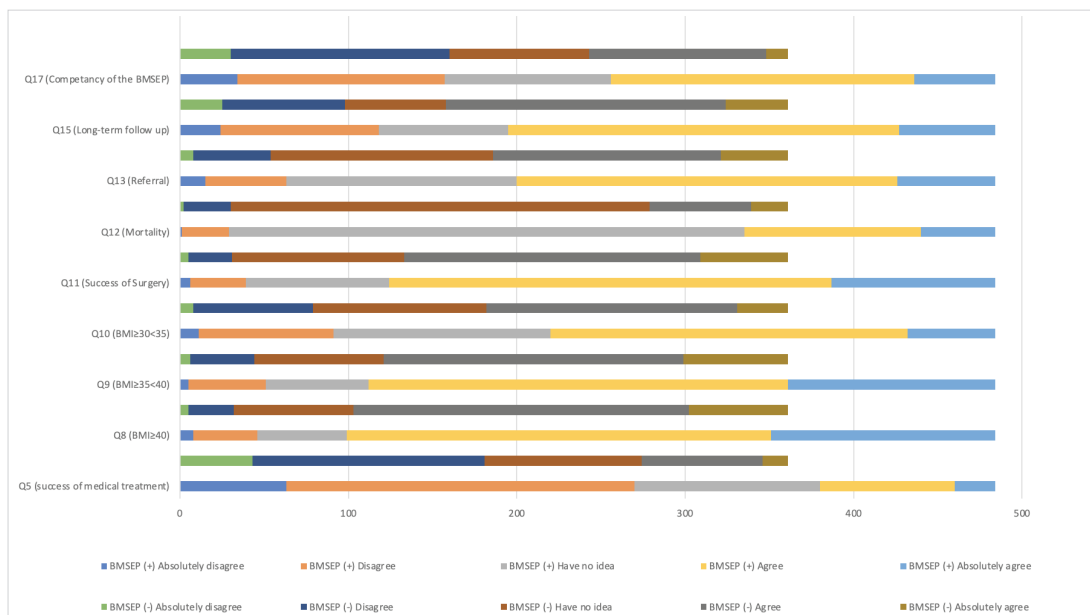


Figure 4. Answers of the students who took the survey to the questions in Likert scale. Students in the BMSEP (+) group replied the questions more accurately in terms of surgical indications, patient referral to surgery and competency of the BMSEP. Likert’s scale (absolutely disagree, disagree, have no idea, agree, absolutely agree).

DISCUSSION

This study aimed to evaluate the knowledge of medical students about BMS and was conducted with 845 medical students in Türkiye. Students in the BMSEP (+) group answered the questions regarding surgical indications, patient referral to BMS, efficacy of BMS, referral of relatives and adequacy of BMS edu-

cation more accurately. However, mortality and risk perspectives of the students were comparable in both groups.

Sufficient education and active participation in the processes of medical students in terms of obesity and its treatment is very important (11). The number of studies evaluating the competence of education for the management and treatment of

morbidly obese patients are limited. A previously published systematic review reported that most of the medical students are negatively biased about obese patients and most of the medical schools do not have an integrated obesity medicine education (12). In the study of Jay et al., it has been reported that physicians who have had additional education in obesity medicine feel more comfortable while treating obese patients (13). Similarly, young physicians who have worked on obesity and its management during their medical education are diligent in presenting treatment options to obese patients and answer questions about BMS more accurately (14). Our previously conducted study including PCPs showed that young physicians were better equipped in BMS indications and referral of patients to BMS (5). These results may be interpreted as improvement of obesity medicine education in recent years despite the major gaps in medical education process.

In most medical schools in our country and in the world, BMS education is given under obesity medicine education, not as a separate program. Since BMS is widely being performed and has become an important subspecialty in surgery, it has become a distinct education program during surgery rotation of medical students. In the present study, there were 36 medical schools having BMSEP (+). The number of studies investigating the knowledge and perceptions of medical students regarding BMS are limited. Banasiak et al. have first emphasized problems and deficiency of BMS education in medical schools. Students who were educated in BMS responded to the questions regarding bariatric surgery more accurately. This study suggests adding BMS education in the curriculum (15). In a study including 298 medical students from the same medical school, it has been reported that the knowledge of medical students was insufficient while they were willing to improve it. The rate for accurate identification of surgical indications was 36.6%, students who believed surgery was a safe alternative in the treatment of obesity was 46%, and students who said they would refer patients to BMS when indicated was 74%. Majority of the students find themselves inadequate in the management of obesity (16). Another study including 468 medical students from year six has reported that students have limited knowledge of BMS but are willing to improve. Majority of the students (77%) have reported that they have not received sufficient education in BMS. It has been concluded that BMS is not a distinct education program in the curriculum among almost all the medical schools (17). Roberts et al. have evaluated the attitude of 13 medical students from year three before and after having received education about BMS. After the education, students' knowledge about obesity, patient education and referral to BMS have been improved significantly. Although conducted with a very limited number of students, this study is important for demonstrating that education improves the perspective of medical students about BMS (18). In our study, the

perception of success with diet and exercise was too low, and the groups were comparable. Referral of obese patients to surgery rate was higher than it was reported in the literature, and this difference was higher in the BMSEP (+) group.

Knowledge level on the indications of BMS was evaluated via three different cases. Two cases were presented in compliance with the National Health Institute consensus criteria while one case was presented as a patient with 30-35 kg/m² body mass index, uncontrolled diabetes mellitus that could not be controlled with medications, which is a relatively new indication (19,20). Referral to surgery rate was twofold high in the BMSEP (+) group in the first two questions. However, groups were comparable for the question regarding metabolic surgery indication. This may be associated with a need for update in the curriculum of BMS education program since the indication is new. Comparison of published articles in this topic may not be feasible since content of the questionnaires and question techniques are different. Characteristics of the questions in Matlok et al.'s study are like formal examination questions evaluating the knowledge level of participants. The question technic is totally different in our study, mostly Likert scale questions were preferred. This method is useful especially in terms of evaluating the attitude of participants and comparing groups. When the results of our study were scrutinized, presence of BMSEP had positive impact on evaluating surgical indications and patient referral to BMS. However, risk perception was still high for BMS referral, participants did not think the quality of BMS education was adequate, particularly in terms of surgical indications and risk of surgical mortality. Further studies investigating the content of curriculum may be necessary for making a precise decision.

This study has several limitations. While the number of participants is adequate, there were no students who answered the questionnaires from some of the medical schools. Although the study is quantically satisfactory, it may not reflect the national data precisely. Another issue is inquiring only the presence of BMSEP, not its content. The students were simply asked if there was a separate BMS course, and the results were evaluated according to this answer. However, this is the first study from our country investigating the impact of BMSEP on the knowledge of medical students. This study showed that the existence of the BMS course alone has a positive contribution to the perception and knowledge of the students. The next process will be to investigate the structure of the program and the impact of its operation.

CONCLUSION

As a conclusion, this study showed that the level of knowledge among the medical students who studied BMS as a separate program was higher. However, attitudes were comparable due to risk perception and cost. We did not inquire the content of

BMSEP, but even the presence of BMSEP may improve the knowledge level and attitude of medical students. Structured education programs in BMS may positively influence knowledge, perception, and attitude of medical students. This approach may increase the role of PCP's in-patient referral to BMS and long-term follow-up.

Ethics Committee Approval: This study was approved by Uludağ University Faculty of Medicine Clinical Research Ethics Committee (Decision no: 2021-6/30, Date: 26.05.2021).

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Conflict of Interest: The authors have no conflicts of interest to declare.

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**ORJİNAL ÇALIŞMA-ÖZET**

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Bariyatrik ve metabolik cerrahi dersinin tıp öğrencilerinin bilgi ve tutum düzeylerine etkisi: Türkiye anket çalışmasıHalil Özgüç¹, Mustafa Narmanlı¹, Özgen Işık²¹ Özel Medicabil Hastanesi, Cerrahi Kliniği, Bursa, Türkiye² Uludağ Üniversitesi Tıp Fakültesi, Cerrahi Anabilim Dalı, Bursa, Türkiye**ÖZET**

Giriş ve Amaç: Bariyatrik ve metabolik cerrahi (BMC), morbid obezitenin en etkili tedavi yöntemidir. Tıp öğrencilerinin BMC konusunda optimum eğitimi, gelecekte morbid obez hastaların doğru değerlendirilmesi için önemlidir.

Gereç ve Yöntem: Beşinci ve altıncı yıllarındaki tıp öğrencileri hedef kitle olarak belirlendi. Web tabanlı bir anket platformu aracılığıyla 17 sorudan oluşan bir anket uygulandı. Anketi yanıtlayan öğrenciler iki gruba ayrıldı: farklı bariyatrik ve metabolik cerrahi eğitim programı (BMCEP) (+) ve (-). İki grubun cevapları ki-kare testi kullanılarak karşılaştırıldı.

Bulgular: Toplamda 845 öğrenci anketi yanıtladı. BMCEP (+) grubunda ($p < 0,05$) cerrahi sevk oranları daha yüksek (%33,4'e karşı %26,5, $p < 0,05$), alternatif tedavi yöntemlerine başvurma oranı düşük (%4,9'a karşı %11,9, $p < 0,05$), vücut kütle indeksi (VKİ) $> 40 \text{ kg/m}^2$ olan örnek hasta ile VKİ $35\text{-}40 \text{ kg/m}^2$ arasında olan örnek hasta için BMC endikasyonlarına ilişkin sorularda "kesinlikle katılıyorum" yanıt oranı daha yüksek ve "fikrim yok" daha düşüktü. Ancak, VKİ $30\text{-}35 \text{ kg/m}^2$ ve kontrolsüz diyabetli örnek hasta için verilen cevaplar açısından iki grup benzerdi. Birinci derece akraba endike olduğunda BMC'ye sevk oranı BMCEP (+) grubunda daha yüksekti. Ameliyatın etkinliği, maliyet ve risk algısı iki grup arasında benzerdi.

Sonuç: Bu çalışma, tıp fakültelerinde belirgin bir BMCEP'e sahip olan tıp öğrencilerinin BMC ile ilgili daha iyi bilgi düzeyine ve karşılaştırılabilir risk algısına sahip olduğunu göstermiştir. BMC'de yapılandırılmış eğitim programları, tıp öğrencilerinin bilgi, ilgi ve tutumlarını doğrudan geliştirebilir; dolaylı olarak birinci basamak hekimlerinin BMC'ye hasta sevk ve uzun süreli izlemdeki rolünü artırabilir.

Anahtar Kelimeler: Tıp eğitimi, morbid obezite, bariyatrik cerrahi, tıp öğrencisi

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