Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letters to the editor

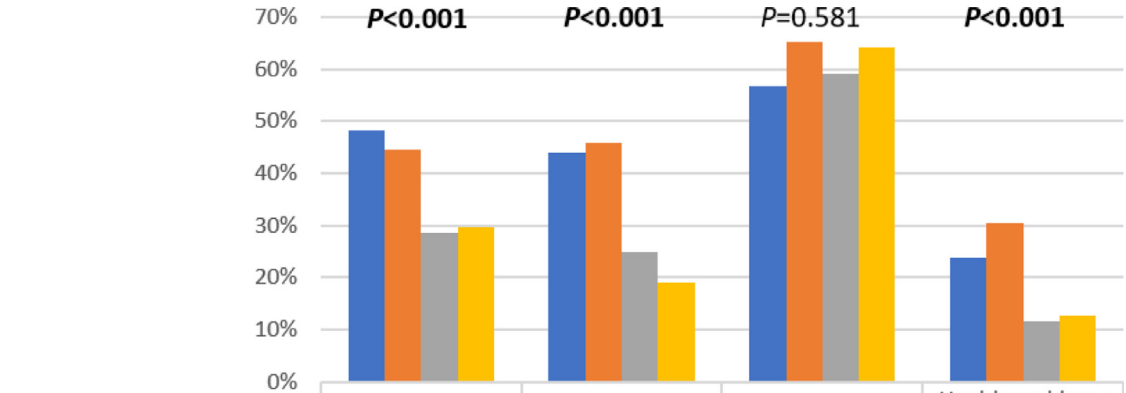
Lifestyle changes in patients with morbid obesity and type 2 diabetes mellitus during the COVID-19 pandemic

Recommendations indicate that all elective metabolic and bariatric surgery should be postponed until after the Coronavirus disease 2019 (COVID-19) pandemic [1,2]. While there are already some data on the impact of a pandemic on general and oncological surgery, there has been nothing for bariatric surgery on its own. Thus far, we have found no publications on the effects of a pandemic on bariatric patients' health and lifestyles nor, in particular, on those who also have type 2 diabetes mellitus (DM2).

That is why we decided to conduct the present study, which was designed as an online survey with the aim of collecting data from bariatric patients during this COVID-19 pandemic. The survey contained multiple-choice and open questions, and was distributed *via* social media. Patients were analyzed as two groups, preoperative patients and postoperative patients, and further subdivided into patients with and without DM2. All statistical analyses were performed using STATISTICA version 13.5 PL software (TIBCO Software, Palo Alto, CA, USA). Statistical significance was set at $P < 0.05$. The study was approved by the local bioethics committee (1072.6120.103.2020) and performed in accordance with ethical standards.

The study group consisted of 895 bariatric patients: 164 preoperative patients (18.32%) with morbid obesity; 135 preoperative patients with morbid obesity and DM2 (15.08%); 375 postoperative patients (41.90%); and 221 postoperative patients with DM2 (24.69%). In addition, 786 patients were female (87%) and 109 were male (13%). Their median age was 39 (33–45) years, and their median body mass index (BMI) was 34.77 (29.30–41.18) kg/m^2.

A total of 139 (46.49%) preoperative patients declared that unhealthy eating habits had begun to prevail due to the epidemic vs. 172 (28.86%) of the postoperative patients ($P < 0.001$), with no significant differences according to DM2 status ($P = 0.520$ in the preoperative group, $P = 0.793$ in the postoperative group), as depicted in Fig. 1. On the other hand, 226 (75.58%) preoperative patients and 468 (78.52%) postoperative patients declared making no changes to their daily protein intakes, with no significant differences between subgroups ($P = 0.261$). However, 63 (21.07%) preoperative patients declared they had increased their caloric intakes and 109 (18.29%) of the postoperative group did so, whereas 79 (26.42%) patients in the preoperative group and 64 (10.74%) in the postoperative group decreased their caloric intakes. Differences between the preoperative and postoperative groups were significant ($P < 0.001$), and changes in their eating habits were independent of DM2 ($P = 0.399$ and $P = 0.592$, respectively).



	Prevailing unhealthy eating habits	Increased body weight	Decreased physical activity	Health problems related to limited access to bariatric care
Preoperative without DM2	48.17%	43.90%	56.71%	23.78%
Preoperative with DM2	44.44%	45.93%	65.19%	30.37%
Postoperative without DM2	28.53%	24.80%	59.20%	11.45%
Postoperative with DM2	29.55%	19.00%	64.25%	12.74%

Fig. 1. Bar graph showing changes in preoperative and postoperative bariatric patients with and without type 2 diabetes mellitus (DM2) due to lifestyle changes imposed by the COVID-19 pandemic.

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Most of the study patients in both groups declared decreased physical activity, with no significant differences between groups [181 (60.54%) preoperative patients vs. 364 (61.07%) postoperative patients; $P = 0.581$], as shown in Fig. 1. However, significantly more patients in the preoperative group with vs. without DM2 declared exercising at home on their own (62.96% vs. 50.61%, respectively; $P = 0.032$) as, similarly, did those in the postoperative group (69.23% vs. 61.33%, respectively; $P = 0.049$). Nevertheless, more patients in the preoperative group than in the postoperative group reported that their body weight had increased due to the pandemic, although there were no differences according to the presence (or not) of DM2 [134 (44.82%) vs. 135 (22.65%), respectively; $P < 0.001$], as shown in Fig. 1.

In addition, 80 (26.76%) of the preoperative patients declared that limited access to bariatric care had caused them health problems compared with 68 (11.41%) patients in the postoperative group ($P < 0.001$), but again regardless of DM2 ($P = 0.200$ vs. $P = 0.648$, respectively), as depicted in Fig. 1. Finally, almost all of the patients declared having a plan to increase their physical activity after the pandemic, albeit with a significantly greater percentage of those in the preoperative than in the postoperative group, regardless of DM2 [291 (97.32%) vs. 534 (92.71%), respectively; $P = 0.026$]. Likewise, the response was similar to a question about changing their eating habits [255 (86.73%) vs. 308 (54.04%), respectively; $P < 0.001$].

COVID-19 has had a global impact on everyone's daily life, including the postponement of all elective surgeries, including bariatric procedures [1,3]. However, we could find no studies documenting non-COVID-19 patients' perspectives on the pandemic and their lifestyle changes. Nevertheless, regardless of DM2 status, we found that both preoperative and postoperative bariatric patients reported an increased prevalence of unhealthy lifestyle eating habits because of the pandemic. In addition, most of the patients in both our study groups decreased their physical activity due to restrictions on going outdoors and the closing of sports facilities. However, even though more patients with DM2 reported exercising at home on their own in both the preoperative and postoperative groups, fewer patients in the postoperative *vs* the preoperative group declared that their body weight had increased due to the pandemic, with no differences with or without DM2.

In summary, the pandemic has promoted unhealthy lifestyle changes in morbidly obese patients, regardless of the presence of DM2, that have led to significant increases in body weight.

Authors' contributions

MW: figures, study design, data collection, data analysis, data interpretation, writing of article; MPS: data collection, data analysis, data interpretation, drafting of article; JS: data collection, data analysis, data interpretation, drafting of article; MP: data collection, data analysis, data interpretation, drafting of article; PM: study design, data interpretation, writing and drafting of article, supervision.

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Disclosure of interest

The authors declare that they have no competing interest.

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Michał Wysocki[a], Maciej Walędziak[b], Monika Proczko-Stepaniak[c], Michał Pędziwiatr[a], Jacek Szeliga[d], Piotr Major[a,*]
[a]*2nd Department of General Surgery, Jagiellonian University Medical College, Jakubowskiego 2, Krakow, Poland*
[b]*Department of General, Oncological, Metabolic and Thoracic Surgery, Military Institute of Medicine, Warsaw, Poland*
[c]*Department of General, Endocrine and Transplant Surgery, Medical University of Gdansk, Gdansk, Poland*
[d]*Department of General, Gastroenterological and Oncological Surgery, Collegium Medicum Nicolaus Copernicus University, Torun, Poland*

*Corresponding author
E-mail address: piotr.major@uj.edu.pl (P. Major).

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