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**Attitudes and knowledge regarding referrals for bariatric surgery among Danish secondary healthcare providers
a national survey**

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(1) Title:

Attitudes and knowledge regarding referrals for bariatric surgery among Danish secondary healthcare providers: a national survey

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(8) Conflicts of interest statement:

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What is already known about this subject?

- Only a small percentage of patients with severe obesity undergo bariatric surgery
- Doctors are in general reluctant to refer patients to bariatric surgery
- Endocrinologists, obstetricians and gynecologists, orthopedic surgeons and otorhinolaryngologists can refer patients to bariatric surgery

What this study adds?

- Most secondary healthcare specialists have limited knowledge about the referral criteria for bariatric surgery
- Barriers to referring patients for bariatric surgery are peri-and post-operative complications

- Secondary healthcare specialists rarely refer patients to bariatric surgery on their own initiative

Abstract:

Background:

Bariatric surgery induces significant and sustained weight loss and subsequently reduces obesity related comorbidities. However, only a small percentage of patients with severe obesity undergo bariatric surgery in Denmark.

There is limited knowledge about the experiences with and possible reservations to bariatric surgery among secondary healthcare providers. The aim of this cross-sectional study was to investigate referral patterns and knowledge regarding the criteria for bariatric surgery among Danish secondary healthcare providers, treating obesity related diseases.

Method:

A questionnaire regarding experiences with and reservations to referring patients for consideration for bariatric surgery, along with thoughts to specific patient cases were sent to several specialists: endocrinologists, obstetricians and gynecologists, orthopedic surgeons and otorhinolaryngologists. Most questions required responses on a 5-point likert scale and frequency distributions were calculated.

Results:

A total of 345 (44%) specialists responded to the questionnaires. Good knowledge of the criteria for referral to bariatric surgery varied among the specialist from 6%-68%. One of the main issues was a concern about the medical and surgical postoperative complications, which was a barrier to and influenced referral decisions. Furthermore, specialists were more likely to refer patients to bariatric surgery when patients requested this.

Conclusion:

Except for endocrinologists, the Danish secondary healthcare specialists interviewed have limited knowledge about bariatric surgery, which results in a reluctance in referring patients. Our results indicate that there is a

need to improve knowledge among specialists, regarding the indications, criteria and outcomes for bariatric surgery to establish a more pro-active, specialist led approach to referrals.

Introduction

The purpose of bariatric surgery is to induce significant and sustained weight loss and therefore reduce obesity related comorbidities. Healthcare providers involved in the treatment of obesity related diseases, in both primary and secondary care are aware of bariatric surgery as a treatment modality. However, only 1% of patients in the United States of America (USA), who meet the body mass index (BMI) criteria for bariatric surgery set by the National Institute of Health, undergo bariatric surgery¹. The number of bariatric surgical procedures performed in Denmark has also been decreasing from 2010-2015².

Previous studies have showed that primary care physicians were reluctant to refer patients to bariatric surgery, primarily due to the risks of medical and surgical postoperative complications³ and a perception that mortality rates were exceptionally high⁴. In addition, Martini et al reported that primary care physicians felt they were under qualified to manage patients who underwent bariatric surgery and requested more education⁵.

Primary care physicians play a key role in referring patients with severe obesity to bariatric surgery. However, secondary healthcare specialists also have a role when managing patients with obesity related conditions such as osteoarthritis, obstructive sleep apnea (OSA), hypertension, type 2 diabetes mellitus (T2DM) and infertility in women with obesity and polycystic ovary syndrome (PCOS). All conditions are known to improve significantly with bariatric surgery⁶⁻¹⁰. Few studies have assessed referral patterns from secondary healthcare providers to bariatric surgery units¹¹⁻¹³. Simon et al found that endocrinologists refer more patients to bariatric surgery in comparison to other physicians: internal medicine, family medicine and women's health¹².

Two previous surveys both conducted in the USA showed that there is a lack of education, inadequately established referral pathways between physicians and surgeons and that a majority of patients evaluated for bariatric surgery are self-referred^{11,13}. To our knowledge no similar surveys have been carried out in a country where bariatric surgery is offered free of charge for people complying with defined criteria. The purpose of this study was to investigate knowledge, attitudes and referral patterns regarding bariatric surgery among four different Danish specialties (endocrinologists, obstetricians and gynecologists, orthopedic surgeons and otorhinolaryngologists) treating patients with obesity related diseases.

Materials and methods

Study sample

We identified consultants from four specialties, 159 orthopedic surgeons, 150 obstetricians and gynecologists and 300 endocrinologists from public hospitals in Denmark. In addition, 169 physicians treating patients with OSA were identified (99 otorhinolaryngologists from public hospitals, 59 from private clinics and 11 doctors with a dual specialization).

Questionnaire

A questionnaire regarding experience and knowledge about bariatric surgery was developed in conjunction with a speciality registrar and a consultant who are involved in the treatment of bariatric patients within the field of endocrinology. After discussing possible barriers to refer potential candidates for bariatric surgery, based on their own experiences and using literature in this field, a semi-structured guideline was created and used to interview three primary care physicians and three endocrinologists, either in person or by telephone. From these initial interviews, a pilot questionnaire was created. The three primary care physicians and three endocrinologists were subsequently invited to give feedback, on both the content and formulations in the questionnaire and it was adjusted accordingly.

The questionnaire sought information regarding demographics, experience with and reservations about referring patients for bariatric surgery. In addition, the respondents were asked about the referral of a case specific to their specialty. Each case presented a candidate for bariatric surgery with no contraindications (for instance a patient with a BMI 42 and poorly controlled T2DM on medical treatment). They were asked if they would refer this patient on their own initiative and at the request of the patient. The questionnaires including the cases are available online both in Danish (as used) and in English (see appendix).

The questionnaire was sent to the doctors by mail and contained a prepaid envelope for returning the questionnaire. A reminder letter including a second copy of the questionnaire and another prepaid envelope were sent out if no response was received.

Analysis

Most of the responses were graded in 5-point Likert scales (1=strongly disagree, 2=disagree, 3= neither agree or disagree, 4= agree and 5=strongly agree). Data was analyzed by percentage frequencies. The answers were subsequently merged as follows- ‘‘strongly agree and agree’’, ‘‘strongly disagree and disagree’’, ‘‘neither agree/disagree’’ and ‘‘don’t know/ blank’’.

Ethics

The regional ethics committee and the Danish Data Protection Agency were consulted and concluded that no approval was required. Additional informed consent was obtained from all individual participants for whom identifying information is included in this article.

Results

The percentage of responses received was: 52% from orthopedic surgeons, 42% from obstetricians and gynecologists, 38% from otorhinolaryngologists and 44% from endocrinologists. Percentages of all responses in the questionnaire are available in the supplementary data (Table 1, Table 2, Table 3 and Table 4).

Experiences with bariatric surgery

Sixty-eight percent of endocrinologists agreed or strongly agreed to have good knowledge about Danish bariatric surgery referral criteria. While among the other groups of specialists only 6-13% strongly agreed or agreed to have adequate knowledge of the referral guidelines (question 3.1) (figure 1).

Barriers to referring for bariatric surgery

Respondents agreed or strongly agreed that there were several issues to referring patients for bariatric surgery. The issues covered operative complications such as anastomotic leak, infection, bleeding, marginal ulceration, internal hernia, gallstones and chronic abdominal pain. Further issues were lack of results from long term data and previous negative experience with bariatric surgery. Of these, 10-17% of respondents mentioned perioperative complications (question 2.1, figure 2a), 6– 28% mentioned postoperative complications (question 2.2, figure 2b), 4-18% mentioned a lack of results from long term follow-up studies (question 2.6, figure 2c) and 1-10% mentioned having negative experiences with bariatric surgery (question 2.7, figure 2d). Overall, endocrinologists were the most concerned about the referral of patients because of peri- and post-operative complications and the lack of long-term follow-up compared to the other specialties.

Case studies

Seventy percent of the endocrinologists interviewed would refer a patient with T2DM to bariatric surgery at the patient's request, but only 41% would refer the same patient on their own initiative (figure 3). The referral percentages among the other specialities varied from 10-11%. On their own initiative, 10% of otorhinolaryngologists would refer patients with OSA, 10% of obstetricians and gynecologists would refer patients with infertility and PCOS and 11% of orthopedic surgeons would refer patients with arthrosis of lower extremities. When patients mentioned or requested a referral to bariatric surgery, the percentages were higher: 33% among otorhinolaryngologists, 27% among obstetricians and gynecologists, and 47% among orthopedic surgeons.

Discussion:

There is a lack of knowledge in the literature regarding referral for bariatric surgery among secondary healthcare providers such as endocrinologists, obstetricians and gynecologists, orthopedic surgeons and otorhinolaryngologists. This study investigated referral patterns regarding bariatric surgery among different specialties in secondary healthcare.

We discovered that endocrinologists felt they had the most knowledge about bariatric surgery whereas the other specialists questioned that they lacked knowledge about the referral criteria for bariatric surgery. However, we cannot speculate whether the knowledge about bariatric surgery has changed over time.

The reluctance to refer patients was in part due to the perceived high risk of peri- and post-operative complications, while the lack of long-term follow-up from bariatric surgeons and previous negative experiences were less important in the decision-making. Our findings are similar to a survey on secondary health care providers which reported that 45.3-68.7% of the participants mentioned surgical risk, complications, morbidity, infection as disadvantages, while only 11.9-31.2 % considered long-term complications, weight regain and dumping as disadvantage for bariatric surgery¹¹. Although, the respondents may overestimate the risk of complications, this finding highlights the need of doing any possible attempt to reduce the peri- and postoperative risk of bariatric surgery.

A high percentage of obstetricians and gynecologists, orthopedic surgeons and otorhinolaryngologists answered “I don't know” to the question assessing barriers to refer patient to bariatric surgery. This could indicate that the awareness about bariatric surgery is limited in this group of secondary healthcare specialists. Furthermore, the study revealed that secondary healthcare providers were more likely to refer patients for bariatric surgery if the patient requested this, whereas they rarely considered the referral on their own initiative.

Not only primary care physicians refer patients with severe obesity to bariatric surgery. Secondary healthcare providers treating people with obesity and obesity related disease should also be aware of bariatric surgery as a treatment option.

The Danish national guidelines for T2DM and OSA recommends bariatric surgery as a weight loss option^{14,15}. International guidelines regarding T2DM also suggests that bariatric surgery should be considered as an alternative or adjunct to lifestyle and pharmacological therapies¹⁶. Among patients with severe OSA 62.8% are considered candidates for bariatric surgery, indicating that sustained weight loss is considered as an alternative for continuous positive airway pressure¹⁷. Additionally, a review by Springer et al found that patients showed an improvement of their osteoarthritic symptoms after bariatric surgery⁹. Summarized, good knowledge about bariatric surgery is necessary for secondary healthcare providers to treat obesity related comorbidities. Sixty-eight percent of endocrinologists stated to have sufficient knowledge about referral to bariatric surgery, which is not surprising given that endocrinologists are primarily responsible for the treatment of patients before and after bariatric surgery in Denmark.

This study identified several barriers to referrals for bariatric surgery. Six to twenty-eight percent of all respondents, expressed concerns about peri-and post-operative complications. This is a relatively low percentage in comparison to the study by Simon et al who found that 57% of primary care physicians had concerns regarding postoperative complications¹².

A continuous effort to reduce complication rates to bariatric surgery is mandatory, and also updated information to peers about the risk of complications is important in order to allow relevant a balanced referral pattern.

We have previously shown that primary care physicians initiate the discussion about bariatric surgery, while patients rarely do. Among specialists treating people with obesity related diseases a small percentage, 10-11%, were likely to refer patients to bariatric surgery, except for endocrinologist where 41% initiated a conversation

about bariatric surgery as a treatment option with patients with T2DM. Primomo et al, showed that endocrinologist seldom referred patients for surgical consultation¹³

However, 17-29%, of secondary healthcare providers, were reluctant to provide information about bariatric surgery, as a possible treatment option for patients with arthrosis, OSA and PCOS with infertility. This is in line with a qualitative study that reported that primary care physicians rarely brought up bariatric surgery as an option, because there were concerns about the risks of bariatric surgery and its complications, including poor quality of life, the need for repeat procedures and mortality rates¹⁸. Wharton et al demonstrated the importance of these findings, as discussing the idea of bariatric surgery with a specialist compared to a primary care physician meant they were more likely to go ahead with the procedure¹⁹. Although no reason is provided for this, one might expect that the information provided by the physicians who are specialist in their field have a greater impact on patients. The willingness to discuss referral to bariatric surgery among secondary health care providers in Denmark are similar compared to primary care physicians³. Although no international surveys have been conducted national differences might be present. Thus, according Lopez et al 51% of primary care physicians would discuss referring patient for bariatric surgery which is much higher than among Danish physicians²⁰.

Not all patients are equally likely to choose bariatric surgery. Rønningen et al showed that patients with higher lifetime adversity were less likely to choose surgery as a solution for severe obesity

²¹. Consequently both primary care physicians and secondary healthcare physicians have an obligation to discuss the optimal treatment options in this group of patients.

The main strength of this study was respondents were from four different specialties that treat patients with obesity related disease. Although the questionnaire was not validated, for instance by test-retest-procedures, it was developed with a focus group of primary care physicians and endocrinologists. The response rate was 38-

52%, which is in keeping with other surveys¹². A limitation of the study is, the study has measured perception study is measuring perception of the participants knowledge and not formally tested their knowledge...

In conclusion, there is a lack of knowledge specifically about referral criteria to bariatric surgery among secondary health providers. There are also several barriers to referring patients and with the exception of endocrinologists, they rarely do this on their own initiative. More knowledge and a proactive approach to referring patients for bariatric surgery among doctors treating those with obesity related diseases should be encouraged.

Conflicts of interest statement:

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Anja Friis Elliott and Deepti B.C have been involved in the analysis of data and literature search. Three authors, Claus Bogh Juhl, Charlotte Røn Stolberg, and Nicola Hepp have been involved in the study design, questionnaire making process along with the collection of data. Two authors, Anna Julie Aavild Juhl and Kalyan Adhikari have been involved in the collection of data, entry and rechecking of the data.

All authors were involved in writing the manuscript and had final approval of the submitted and published versions.

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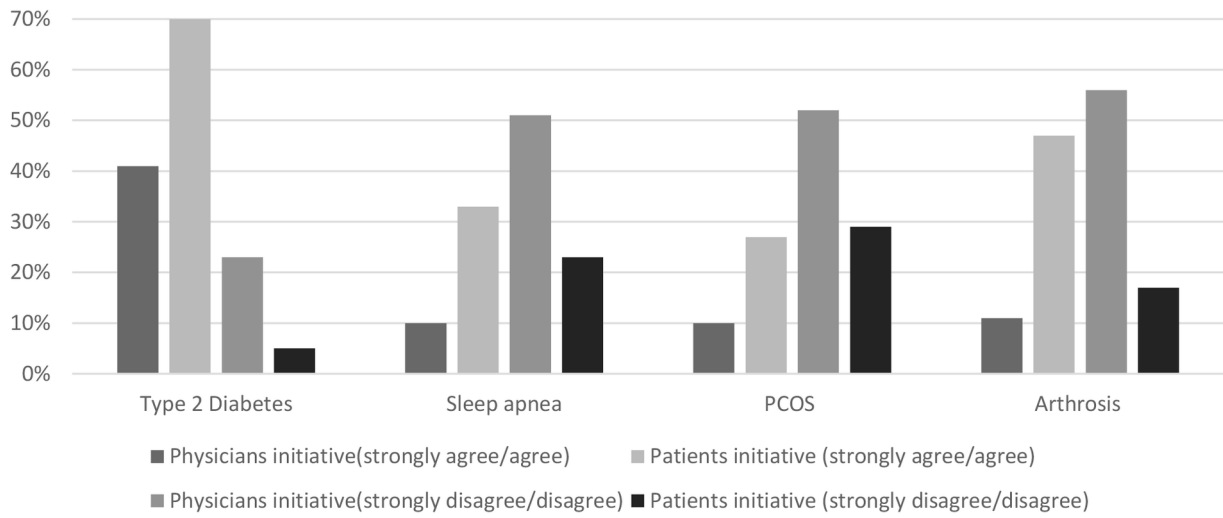
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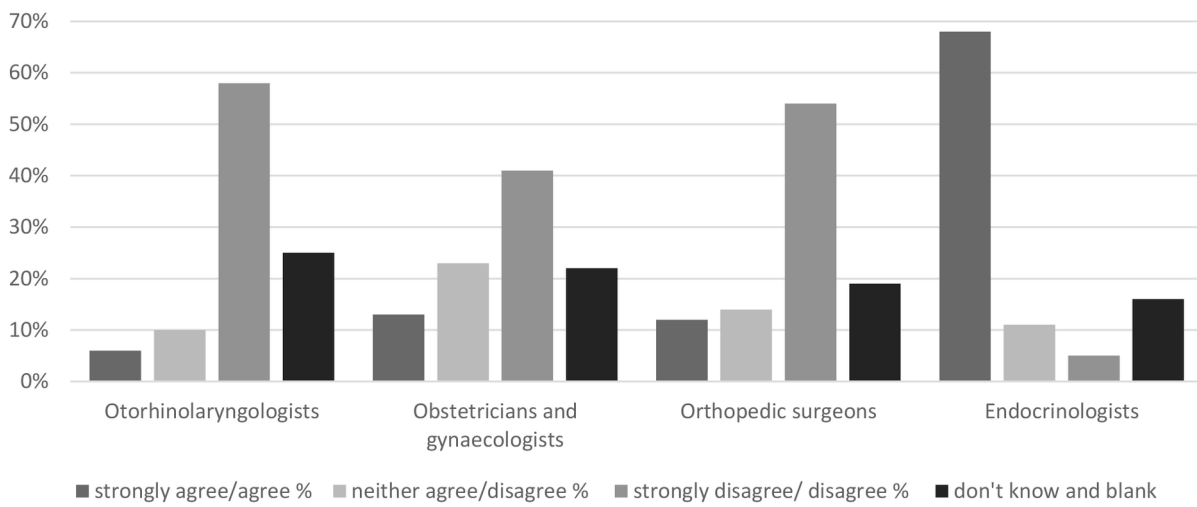
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Figure 3

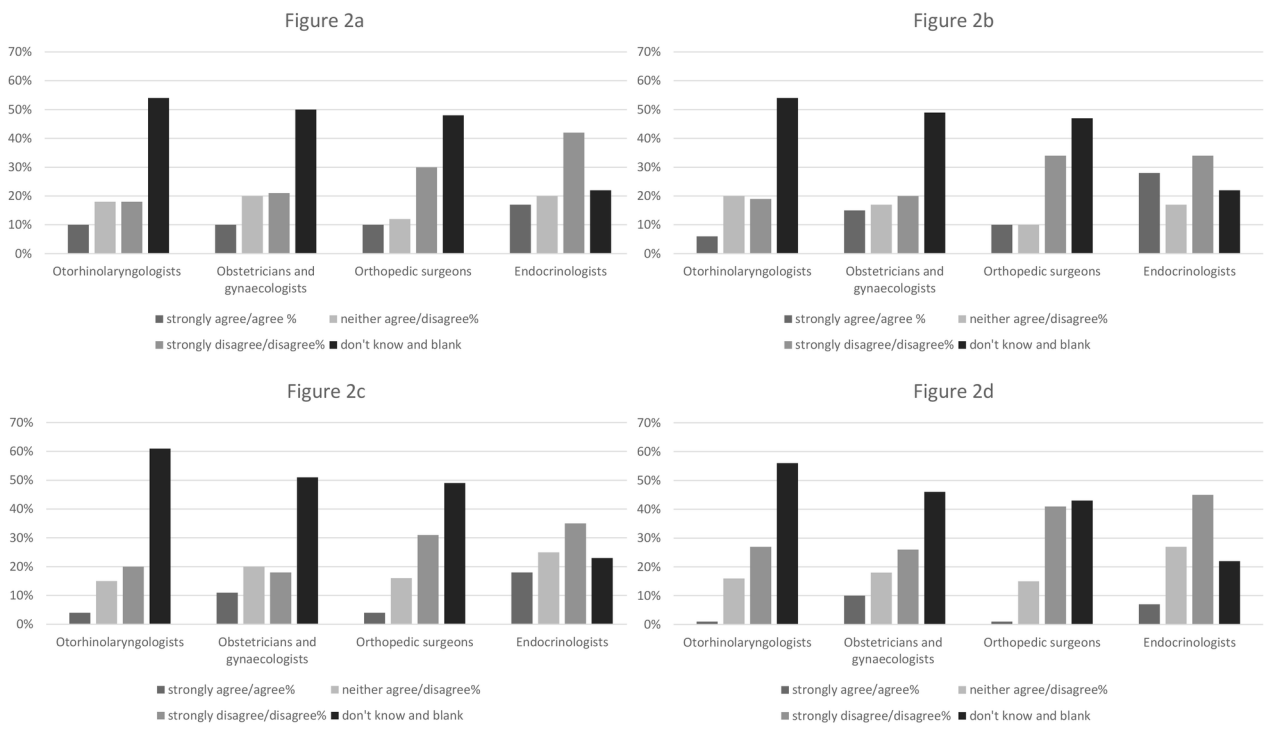


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Figure 1



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Table and Figure Legends

Figure 1. Frequency distributions in percent in reply to questions 1.3: “I have good knowledge of the criteria for referral to bariatric surgery” among endocrinologists, obstetricians and gynecologists, orthopedic surgeons and otorhinolaryngologists.

Figure 2. Frequency distributions in percent as agreement to reluctance of referral to bariatric surgery among endocrinologists, obstetricians and gynecologists, orthopedic surgeons and otorhinolaryngologists. Figure 2a, question 2.1: “I am hesitant to refer patients for bariatric surgery because I am concerned about the risk associated with the operation (e.g. anastomosis leakage, infection, bleeding”. Figure 2b, question 2.2: “I am hesitant to refer patients for bariatric surgery because I am concerned about post-operative complications e.g. gastric ulcer, internal herniation, gallstones and chronic abdominal pain”. Figure 2c, question 2.6: “I am hesitant to refer patients for bariatric surgery due to the lack of long term data on the risk of side effects and complications of bariatric surgery”. Figure 2d, question 2.7: “I am hesitant to refer patients to bariatric surgery because I have negative experiences with bariatric surgery”.

Figure 3: Frequency distributions in percent agreement toward referral for bariatric surgery in specified clinical cases (Questions 3.1-3.6) among endocrinologists, obstetricians and gynecologists, orthopedic surgeons and otorhinolaryngologists.

Table 1: Experiences with Bariatric Surgery, by Frequency distributions in percent in reply to questions or by number.

Table 2: Conditions that may influence the probability to refer patients for bariatric surgery, by Frequency distributions in percent in reply to questions.

Table 3: examples of patients, who are all candidates for bariatric surgery. In all cases it is assumed, that the patient meets the criteria for bariatric surgery and that there are no contraindications for surgery. Frequency distributions in percent in reply to questions.

Table 4: Thoughts on the future treatment options of severe obesity, by frequency distributions in percent in reply to questions.