



Knowledge and Attitudes Towards Obesity and Bariatric Surgery in Chinese Nurses

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Abstract

Background Obesity has become a global epidemic. Surgical treatment of obesity and metabolic disorders in China is increasing rapidly, but it is still a new discipline even to health professionals. As an important member of the multidisciplinary team, the knowledge and attitudes of nurses provide crucial health care to the patients and support to surgeons.

Objectives To study the Chinese nurses' knowledge of obesity and metabolic disorders, and attitudes towards bariatric surgery and to improve their capability of work in this new discipline.

Methods This is a multicenter study, with the questionnaire distributed to cooperative hospitals in the form of an electronic questionnaire by the First Affiliated Hospital of Jinan University in April 2018. A questionnaire was designed to investigate nurses' demographic, knowledge, and attitude towards obesity, weight loss, and bariatric surgery.

Results A total of 5311 questionnaires were received, with an effective rate of 91.8% (4878 questionnaires); 65.2% of nurses had a normal BMI. Nurses generally had a high knowledge of obesity and related cardiovascular diseases (98.6%) and type 2 diabetes mellitus (90.2%). However, there was a lack of knowledge in other related aspects, for example its relations to carcinoma (49.5%), gastroesophageal reflux disease (40.1%), and psychological disorders (49.1%), which are controversial issues in bariatric surgery. It was found that education ($p < 0.05$) had an important influence to nurses' knowledge about the comorbidities of obesity. Female nurses had a higher tendency to choose weight loss than males, but male nurses did physical exercise more frequently than females ($p < 0.05$). Their acceptance of safety (25.1%) and efficacy (22.9%) of bariatric surgery is low, with concerns predominantly about postoperative complications and adverse effects. Surgical nurses had a more optimistic attitude towards surgery ($p < 0.05$).

Conclusions Chinese nurses have poor knowledge of obesity-related metabolic disorders and also have poor acceptance of surgical treatment modalities. Our findings suggest that it is crucial to enhance the continuing education of Chinese nurses for obesity, metabolic disorders, and bariatric surgery.

Keywords Nurses · Obesity · Bariatric surgery · Knowledge · Attitude

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Obesity has become a global epidemic. In 2016, 39% of women and 39% of men aged 18 and over were overweight [1]. Surgical treatment of obesity and metabolic disorders increases rapidly in China, but it is still a new discipline even to health professionals and there is low awareness among nurses. There are not many professional bariatric case managers; thus, bariatric patients are mainly cared for by nurses. As an important member of the multidisciplinary team, the knowledge and attitudes of the nurses provide crucial health care to the patients and support to surgeons. However, the role of nurses is often undermined/neglected in health education, promotion counseling, and postoperative follow-up.

Some studies indicated that nurses have a negative attitude towards overweight or obese patients and possess a lack of knowledge about obesity [2–4]. The knowledge and attitudes towards obesity and bariatric surgery in Chinese nurses have been seldom studied. Therefore, we should pay more attention to the misunderstandings and gaps in the field of obesity and bariatric surgery among nurses. This study aimed to specially investigate the attitudes and knowledge of nurses in China regarding obesity and bariatric surgery and to analyze any differences between different nurses. This information is useful to improve perioperative nursing care, improved postoperative follow-up rates, and thus better patient outcomes.

Methods

Study Samples

All samples were registered nurses who agreed to participate in this study from different geographic provinces of China. This is a multicenter study, with the questionnaire distributed to cooperative hospitals in the form of electronic questionnaire by the First Affiliated Hospital of Jinan University in China in April 2018. A total of 5311 questionnaires were received, with an effective rate of 91.8% (4878 questionnaires).

Survey Design

A draft questionnaire was designed by the authors, referring to similar questionnaires in the literature [3, 5, 6], but revised in order to be suitable for Chinese nurses. It was tested, and minor revision was made based on feedback from 89 nurses. This questionnaire (Appendix) consisted of three parts. Part 1 assessed the knowledge of obesity and its related comorbidities and treatment. Part 2 found out attitudes towards weight loss and bariatric surgery. The last part of the questionnaire was the basic demographics of the participants, including gender, age, height, weight, education background, hospital level, and department. Participants were asked to answer with categorical field or choose “yes”, “no” or “do not know.” No financial and other material incentives were offered to the participants.

Data Analysis

All data were analyzed by SPSS (version 13.0) statistical software, and two machine input: that is, two researchers independent with one computer to make one input, completely consistent data, can enter analysis. Keep the original serial number as the standard for dual-machine comparison. Demographic, hospital level, and department were calculated by descriptive statistics and frequency counts. The chi-square test and Fisher exact test examined the potential association among categorical variables. A *p* value < 0.05 was considered statistically significant.

Results

Demographics

There were 4878 nurses (121 males, 2.5%; 4757 females, 97.5%) in this study. The age of the nurses ranged from 18 to 57 years; 65.2% of nurses had normal BMI ($18.5 \leq \text{BMI} < 24.0$), 99.3% of

Table 1 Demographics of the samples

	<i>n</i> (%)	Means ± SD
Gender		Nil
Male	121 (2.5)	
Female	4757 (97.5)	
Age (years old)		31.31 ± 7.79
18–27	1942 (39.8)	
28–37	1874 (38.4)	
38–47	874 (17.9)	
48–57	188 (3.9)	
BMI (kg/m ²)		21.34 ± 2.90
< 18.5	805 (16.5)	
18.5–23.9	3181 (65.2)	
24–27.9	773 (15.8)	
≥ 28	119 (2.4)	
Education		Nil
Associate degree	2355 (48.3)	
Bachelor’s degree	2490 (51)	
Master’s degree	28 (0.6)	
Doctoral degree	5 (0.1)	
Hospital level		Nil
Primary hospital	221 (4.5)	
Secondary hospital	250 (5.1)	
Tertiary hospital	4407 (90.3)	
Department		Nil
Internal medicine	1689 (34.6)	
Surgery	1236 (25.3)	
Pediatrics	325 (6.7)	
O&G	443 (9.1)	
ICU	289 (5.9)	
Operation room	150 (3.1)	
Other	746 (15.3)	

The BMI cutoff point was determined using the criteria of weight for adults in published Health Industry Standards of the People’s Republic of China

BMI body mass index, *O&G* obstetrics and gynecology, *ICU* intensive care unit

Table 2 BMI categories by demographic variables

	BMI								<i>p</i>
	< 18.5		18.5–23.9		24–27.9		≥ 28		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Gender									0.02*
Male	9	7.4	77	63.6	29	24.0	6	5	
Female	796	16.7	3104	65.3	744	15.6	113	2.4	
Age (years old)									< 0.01*
18–27	558	28.7	1188	61.2	163	8.4	33	1.7	
28–37	209	11.2	1250	66.7	359	19.2	56	3.0	
38–47	33	3.8	612	70	206	23.6	23	2.6	
48–57	5	2.7	131	69.7	45	23.9	7	3.7	
Education									< 0.01*
Associate degree	461	19.6	1492	63.4	351	14.9	51	2.2	
Bachelor's degree	337	13.5	1666	66.9	420	16.9	67	2.7	
Master's degree	5	17.9	21	75	1	3.6	1	3.6	
Doctoral degree	2	40	2	40	1	20	0	0	
Self-estimation of weight									< 0.01*
Underweight	540	71.1	220	28.9	0	0	0	0	
Normal	243	12.8	1624	85.8	26	1.4	0	0	
Overweight	22	1	1337	60.1	747	33.6	119	5.3	
Hospital levels									0.094
Primary hospital	54	24.4	132	59.7	30	13.6	5	2.3	
Secondary hospital	40	16	163	65.2	40	16	7	2.8	
Tertiary hospital	711	16.1	2886	65.5	703	16	107	2.4	
Departments									< 0.01*
Internal medicine	296	17.5	1095	64.8	260	15.4	38	2.2	
Surgery	234	18.9	790	63.9	184	14.9	28	2.3	
Pediatrics	67	20.6	219	67.4	32	9.8	7	2.2	
O&G	71	16	277	62.5	84	19	11	2.5	
ICU	34	11.8	199	68.9	49	17	7	2.4	
Operation room	15	10	100	66.7	31	20.7	4	2.7	
Other	88	11.8	501	67.2	133	17.8	24	3.2	

**p* < 0.05, statistically significant

nurses had a bachelor and associate degree, and 90.3% of nurses were from tertiary hospitals. Demographics of the nurses are shown in Table 1. By analysis, gender (*p* = 0.02), age (*p* < 0.01), education (*p* < 0.01), self-estimation of weight (*p* < 0.01), and department (*p* < 0.01) were found to be statistically significant in correlation with the BMI of the participants (Table 2).

Nurses' Knowledge Towards Obesity

More than 80% of nurses had some basic knowledge of obesity, while only 52.3% knew that obesity is mainly related to genetics (Table 3). Nurses generally had a high knowledge of obesity-related comorbidities, such as cardiovascular diseases (98.6%) and type 2 diabetes mellitus (90.2%). There was a lack of

knowledge in other related aspects, for example its relations to carcinoma (49.5%), gastroesophageal reflux diseases (40.1%), and psychological disorders (49.1%). It was found that education (*p* < 0.05) had an important influence on the nurses' knowledge about obesity and its comorbidities (Table 4).

Nurses' Attitude Towards Weight Loss

Over 90% of nurses had high expectations of their body shape, especially females (*p* < 0.05). Although 59.4% of nurses acknowledged the importance of weight control, only 38.7% had habits of regular physical exercise. Female nurses were more likely to accept advice about weight loss than males (*p* < 0.05) (Table 5). A majority of nurses (99%) agreed that physical

Table 3 Nurses' knowledge towards obesity

Questions	Yes, <i>n</i> (%)	No, <i>n</i> (%)	Do not know, <i>n</i> (%)
BMI is an important indicator for evaluating the level of obesity	4474 (91.7)	223 (4.6)	181 (3.7)
Know how to calculate BMI	3955 (81.1)	402 (8.2)	521 (10.7)
Obesity is mainly related to genetics	2552 (52.3)	2100 (43.1)	226 (4.6)
Obesity is mainly related to diet and lifestyle	4751 (97.4)	100 (2.1)	27 (0.6)
Obesity is associated with sleep and psychosocial conditions	4503 (92.3)	265 (5.4)	110 (2.3)

Table 4 Nurses’ knowledge towards obesity-related comorbidities

Obesity-related comorbidities	Level of education				Total number of responses	p value
	Associate degree (n = 2355)	Bachelor’s degree (n = 2490)	Master’s degree (n = 28)	Doctoral degree (n = 5)		
Cardiovascular diseases	2309	2468	28	5	4810	0.014*
Fatty liver	2124	2317	26	5	4472	0.004*
T2DM and insulin resistance	2092	2278	28	3	4401	0.001*
Sleep apnea, snoring	1991	2242	26	4	4263	< 0.001*
Kidney disease	1562	1649	10	4	3225	0.008*
Infertility and miscarriage	1311	1573	13	3	2900	< 0.001*
Osteoarthritis, joint pain (gout)	1068	1427	15	2	2512	< 0.001*
Carcinoma	1083	1317	12	2	2414	< 0.001*
Psychological disorders	1115	1266	10	3	2394	0.033*
GERD	872	1071	9	2	1954	< 0.001*

T2DM type 2 diabetes mellitus, GERD gastroesophageal reflux disease

*p < 0.05, statistically significant

exercise is effective to lose weight. There were only 640 (13.1%) nurses who were aware of surgery as an option of weight loss. Other recognized methods of weight loss included dieting (60.1%), intervention by family or friend (37.2%), psychological counseling (33.8%), pharmacotherapy (12.1%), and other (5.0%).

Nurses’ Knowledge and Attitude Towards Bariatric Surgery

Only 16.2% of nurses replied “yes” to the opinion that diabetes can be controlled by surgery. At present, their acceptance of the safety (25.1%) and efficacy (22.9%) of bariatric surgery is low; 80.3% of the nurses claimed that they will recommend bariatric surgery to patients who meet the requirements of surgery. Despite this, only 22.5% of them will recommend bariatric surgery to their family and friends (Fig. 1).

In addition, a number of nurses (95.9%) held a traditional opinion that liposuction is the main option of weight loss surgery. Less than one quarter of the cohort was aware of

specific bariatric procedures (gastric bypass, 39.2%; sleeve gastrectomy, 35%). It was found that surgical nurses were more easily to accept bariatric surgery, compared to nurses from other specialty (p < 0.01) (Table 6).

A total of 2245 nurses knew surgery as a modality of treatment for obesity and metabolic diseases. Nurses obtained information about bariatric surgery mainly from medical professionals (57.7%) and mass media, such as TV (60.4%), websites (54.4%), mobile phone APPs (45.9%), newspaper (41.8%), magazine (36.9%), and social network platform (25.1%). Only a minority of nurses named school education (5.6%) and government education (4.9%) as a source of knowledge.

Discussion

Obesity has become a global epidemic. Surgical treatment of obesity and metabolic disorders in China is increasing rapidly, but it is still a new discipline even to health professionals. Even physicians and other health-related professionals may not know

Table 5 Nurses’ attitude towards weight loss

Questions	Number of yes			p value
	Male, n (%)	Female, n (%)	Total, n (%)	
Do not want to get fat	104 (86.0)	4406 (92.6)	4510 (92.5)	0.009*
Think myself need to lose weight	54 (44.6)	2844 (59.8)	2898 (59.4)	0.005*
I’ve lost weight myself	41 (33.9)	2324 (48.9)	2365 (48.5)	0.006*
Have regular physical exercise habits	68 (56.2)	1821 (38.3)	1889 (38.7)	0.002*
I will search for weight loss information from the Internet	29 (24.0)	2036 (42.8)	2065 (42.3)	0.002*
I will consult health care providers about weight loss	28 (23.1)	1740 (36.6)	1768 (36.2)	0.016*
Know weight loss information from family or friends	27 (22.3)	2153 (45.3)	2180 (44.7)	0.001*
If the doctor advised me to lose weight, I would do it	80 (66.1)	3633 (76.4)	3713 (76.1)	0.026*

*p < 0.05, statistically significant

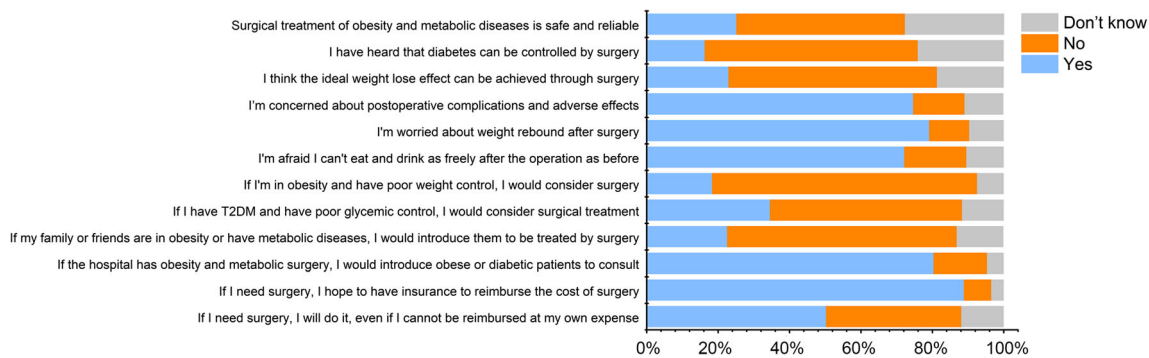


Fig. 1 Declared nurses' knowledge and attitudes towards bariatric surgery. Samples were asked to choose "yes", "no" or "do not know" with each question

much about bariatric surgery [7]. The knowledge and attitude of obesity and bariatric surgery has been seldom studied; thus, this study is important to investigate the knowledge and attitudes towards obesity and bariatric surgery in Chinese nurses.

Nurses' Gender

There is a well-recognized gender bias among the nursing professionals, with majority of nurses being female worldwide. According to data released by the Chinese government department, there are 4.1 million registered nurses [8], of which only 100,000 are males [9]. Some studies have showed that the proportion of male nurses in the USA and UK is 10.69% and 6.6%, respectively, while in other countries, the proportion is 5% in Canada, 10.4% in Australia, 18% in Germany, 22.9% in Portugal, 25% in Philippines, and 29% in Iran [10]. The Nursing Council of Hong Kong showed that a total of 27,205 registered nurses were female, but only 3465 were male up to the end of 2012 [11].

Incidence of Obesity in the Participants

In this study, most of the nurses (65.2%) had a normal BMI, and the incidence of obesity was only 2.4%, which was lower than the Chinese general population [12]. But in a previous study from the USA, it was found that 30% and 18.7% of nurses were overweight and obese, respectively, and even 5.2% of nurses were morbidly obese [13]. The incidence of obesity among nurses from Germany and Hong Kong (China) was higher than that in mainland China [2, 3]. This may be caused by the differences in food, eating habits, and other aspects of people in mainland China from western countries and Hong Kong (China). At the same time, it may also explain the reasons why Chinese nurses have insufficient knowledge of obesity.

In addition, older nurses were more likely to be overweight or obese compared to younger nurses. This finding is consistent those reported in the literature [13]. Nurses working in administrative departments had higher incidence (3.2%) of obesity than that in clinical departments. A foreign study found that 36.2% of nurses were obese who worked in administration and management [14].

The higher incidence of obesity in these nursing roles may be related to reduced workload, long-term sedentary lifestyle, and lack of exercise. Moreover, there is a custom that Chinese nurses are mainly engaged in administration or management positions when they have worked for a certain number of years.

Knowledge Towards Obesity and Related Comorbidities

In this study, we found that there are many deficiencies and misunderstandings about obesity in Chinese nurses. It was found that 1337 nurses were of normal BMI but regarded themselves as overweight (Table 2). This may be due to a lack of knowledge about the specific classifications of BMI. Other factors may include high personal and societal standards of ideal body weight among Chinese nurses. An American study also found that only 170 nurses accurately identified themselves as overweight or obese in 224 overweight nurses, and only 26% of nurses knew how to use BMI to classify obesity levels [13]. A Swiss study showed that the reason why some doctors and nurses did not have knowledge and skills in obesity diagnosis is due to a lack of guidelines of obesity and lifestyle; after that study, Geneva revised a pregraduate and postgraduate curriculum for medical students and doctors, as well as health care providers [15]. It is thus necessary to improve the knowledge and communication skills about obesity [16, 17]. Every nurse should master BMI, waist circumference, hip circumference, etc., as important indicators for evaluating obesity. There were courses related to obesity in Chinese associate and undergraduate nursing education, but the content was relatively shallow.

In regard to obesity-related comorbidities, it could be seen that nurses with a master's degree or above were more fully aware of its complications (Table 4). However, nurses at all education levels lacked knowledge of the other related aspects, for example the relationships between obesity to carcinoma (49.5%), gastroesophageal reflux diseases (40.1%), and psychological disorders (49.1%), which are the controversial issues in bariatric surgery. The World Obesity Federation announced their position statement that "Obesity is a chronic relapsing disease process" [18]. However, a significant

Table 6 Knowledge and attitudes towards bariatric surgery of nurses in different departments

Question	Number of yes, <i>n</i> (%)						<i>p</i> value	
	Internal medicine	Surgery	Pediatrics	O&G	ICU	Operating room		Other
Surgical treatment for obesity and metabolic diseases is safe and reliable	432 (25.6)	376 (30.4)	56 (17.2)	112 (25.3)	56 (19.4)	35 (23.3)	157 (21.0)	< 0.01*
I have heard that diabetes can be controlled by surgery	287 (17.0)	230 (18.6)	40 (12.3)	60 (13.5)	32 (11.1)	28 (18.7)	115 (15.4)	< 0.01*
I think the ideal weight lose effect can be achieved through surgery	403 (23.9)	334 (27.0)	61 (18.8)	84 (19.0)	51 (17.6)	32 (21.3)	155 (20.8)	0.001*
If I have T2DM and have poor glycemic control, I would consider surgical treatment	525 (31.1)	464 (37.5)	128 (39.4)	154 (34.8)	108 (37.4)	52 (34.7)	251 (33.6)	0.025*
If my family or friends are in obesity or have metabolic diseases, I would introduce them to be treated by surgery	357 (21.1)	333 (26.9)	71 (21.8)	92 (20.8)	62 (21.5)	32 (21.3)	152 (20.4)	0.006*

**p* < 0.05, statistically significant

proportion of the general population including a minority of endocrinologists and health care professions did not consider obesity as a disease in China. Nurses have different levels of knowledge of obesity and may be related to educational intensity and learning ability.

As present, China has gradually increased the publicity and popularization of obesity. Some professional associations related to obesity and metabolic diseases were established. Bariatric surgery has been increasingly incorporated into the curriculum of medical schools, with inclusion in student textbooks [19]. The Chinese government has also put forward the concept of healthy weight in its national policies, appealing to the public to keep fit.

Knowledge and Attitude Towards Weight Loss and Bariatric Surgery

Chinese nurses have a strong sense of losing weight, but few actually do it. Our data showed that 59.4% of nurses believe that they need to lose weight, but only 38.7% of nurses have a habit of regular exercise. On the one hand, it may be due to a lack of motivation; on the other hand, it may be that they possess insufficient time for exercise due to large workloads. A study has also showed that some nurses may not follow recommended guidelines for nutrition and exercise which may be related to gender and age [20]. In Sweden, about 50% of nurses seldom calculate their own BMI, and nearly one third of nurses rarely exercise or eat healthily [21].

At the same time, there were certain differences in gender attitudes towards weight loss. Table 2 shows that male nurses have higher incidence of being overweight and obese than female nurses, which probably explains why male nurses (56.2%) may have higher intention to engage in regular physical exercise than female nurses (38.3%). Female nurses expressed greater intention to lose weight, but they were less likely to be actively mobile. On the basis of mastering the knowledge of obesity, medical staff should pay more attention to their personal weight changes and health status and set up a good example of healthy being.

Our data showed that most nurses still believed the modalities of weight loss to be limited to exercise and diet, similar to previous studies [21–23]. Perhaps because these two methods are more economical, convenient, and feasible, close to the needs of the public. Only 13.1% of nurses knew that surgery can be an option for weight loss, and 39.2% and 35.5% of nurses had heard of gastric bypass and sleeve gastrectomy, respectively. This might be related to the lack of continuing medical education and access to learning materials.

Nurses' acceptance of safety (25.1%) and efficacy (22.9%) of bariatric surgery is low, mainly concerned about postoperative complications and adverse effects. This contrasts to the concerns of surgeons' which include the benefits of bariatric

surgery to reduce obesity comorbidities and improve patient's quality of life [24].

It was also interesting to find that when nurses face different people, attitudes towards bariatric surgery vary. Only 22.5% of nurses accepted bariatric surgery and recommended it to their family or friends (Fig. 1), indicating that they still lack confidence in it. But when faced with patients, more than 80% of nurses recommended bariatric surgery. It could be seen that nurses make different decisions in different social roles, and they will recommend bariatric surgery when they assume the social role as “nurse.”

Finally, the study found that surgical nurses have more optimistic attitude towards bariatric surgery. This may be related to the content of their normal work. Surgical nurses mainly care for surgical patients, so they know more about surgical methods and related nursing. There is an urgent need to strengthen education of nonsurgical nurses on obesity, metabolic diseases, and bariatric surgery in China.

Recommendations

Medical education on obesity and related disorders should be enhanced among nursing students. The contents about metabolic and bariatric surgery were added into the textbook of Chinese undergraduate medical students in 2018 [19]. The training courses and curricula for nursing should be also updated accordingly.

Besides, continuing education about new ideas and new treatment modalities, including obesity and metabolic surgery, etc., should also be emphasized among nurses. Nurses play important roles in medical work not only in the treatment but also in the prevention of diseases such as obesity and metabolic disorders. Only by improving the knowledge of nurses can we better serve human health.

Moreover, hospital could provide working nurses with the opportunity to attend academic conferences and learn about the latest developments in various disciplines. It is important to encourage nurses to upgrade their educational qualifications and improve their own capacity, especially in the new discipline of metabolic and bariatric surgery in China.

Furthermore, the government authorities could invest revenue in public health campaigns to raise awareness of obesity among general population and health professionals. This may include through official media and national policies. Obesity must be recognized as a public health problem with physical and economic implications to the population.

Strengths and Limitations

To our knowledge, this study is the first of its kind to explore the knowledge and attitudes of Chinese nurses towards obesity and bariatric surgery in China. As an important part of the whole medical system, nurses' knowledge and attitudes strongly influence the quality of care which patients receive. This may be a meaningful and interesting study to better understand the international popularity of bariatric surgery, which may be beneficial to the promotion and popularization of bariatric surgery in China in the future. However, it also has some limitations. There may be some potential sources of bias in the voluntary self-reported data designed for this study. Outcomes to the recommendations can be further studied in the future.

Conclusions

Chinese nurses have poor knowledge of obesity-related metabolic disorders and also have poor acceptance of surgical treatment modalities. Our findings suggest that it is crucial to enhance the continuing education of Chinese nurses for obesity, metabolic disorders, and bariatric surgery.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflicts of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the institutional review boards of the hospital.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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Appendix

Questionnaire of nurses' knowledge and attitude towards obesity and bariatric surgery

Dear all,

Hello, we are doctors and nurses from the First Affiliated Hospital of Jinan University. We are investigating nurses' knowledge of obesity and metabolic disease and their acceptance of various treatment, to propose better improvement plans. There is no right or wrong answer. Please choose the most appropriate answer according to your actual understanding of the problem. This study is conducted anonymously. The information you provide will be kept strictly confidential. Data collected will be analyzed and published as academic article. Please fill in the questionnaire and return to us if you agree to participate. Thank you very much for your support and participation!

1. **Your gender:** Male Female
2. **Your age:** _____ years old
3. **Your height:** _____ cm **Your weight:** _____ kg
4. **Education:** Associate's degree Bachelor's degree
 Master's degree Doctoral degree
5. **Hospital level:**
 Primary hospital Secondary hospital Tertiary hospital
6. **Department:**
 Internal medicine Surgery Pediatrics
 Obstetrics and Gynecology Intensive Care Unit Operation room
 Other
7. **Self-estimation of weight:**
 Underweight Normal Overweight
8. **Knowledge about obesity**

	Yes	No	Don't know
BMI is an important indicator for evaluating the level of obesity			
Know how to calculate BMI			
Obesity is mainly related to genetic			
Obesity is mainly related to diet and lifestyle			
Obesity is associated with sleep and psychosocial			

9. Do do you know obesity of comorbidities?

- Cardiovascular diseases (hypertension, heart disease, stroke)
- Psychological disorders
- Gastroesophageal reflux disease (sour regurgitation and heartburn)
- Carcinoma
- T2DM and insulin resistance (hyperglycemia)
- Sleep apnea, snoring
- Osteoarthritis, joint pain (gout)
- Infertility and miscarriage
- Fatty liver
- Kidney disease

10. Attitude towards loss weight

	Yes	No	Don't know
I don't want to get fat			
Think myself need to lose weight			
I've lost weight myself			
Have regular physical exercise habits			
I will search for weight loss information from the Internet			
I will consult health care providers about weight loss			
Know weight loss information from family or friends			
If the doctor advised me to lose weight, I would do it			

11. Attitude towards bariatric surgery treatment of obesity and metabolic diseases

	Yes	No	Don't know
Surgical treatment of obesity and metabolic diseases is safe and reliable			
I have heard that diabetes can be controlled by surgery			
I think the ideal weight lose effect can be achieved through surgery			
I'm concerned about postoperative complications and adverse effects			
I'm worried about weight rebound after surgery			
I'm afraid I can't eat and drink as freely after the operation as			

before			
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12. What do you know about weight loss surgery?

- Liposuction
- Gastric bypass
- Sleeve gastrectomy
- Other

13. Attitude towards bariatric surgery treatment of obesity and metabolic diseases

	Yes	No	Don't know
If I am in obesity and have poor weight control, I would consider surgery			
If I have T2DM and have poor glycemic control, I would consider surgical treatment			
If my family or friends are in obesity or have metabolic diseases, I would introduce them to be treated by surgery			
If the hospital has obesity and metabolic surgery, I would introduce obese or diabetic patients to consult			
If I need surgery, I hope to have insurance to reimburse the cost of surgery			
If I need surgery, I will do it, even if I cannot be reimbursed at my own expense			

14. What you think is an effective way to lose weight?

- Dieting
- Physical exercise
- Pharmacotherapy
- Surgery
- Psychological counseling
- Intervention by family or friends
- Other

15. Before doing this questionnaire, did you hear about bariatric surgery treatment of obesity and metabolic diseases?

- Heard (If select this option, please skip to no.17 question)
- Not heard (If select this option, end this questionnaire)

16. Which of the following ways do you know about the bariatric surgery treatment of obesity and metabolic diseases?

- Newspaper
- TV
- Magazine

- Website
- Mobile phone APPs
- social network platform
- The relatives and friends
- Medical professions
- School education
- Government education
- Relevant popular science knowledge
- Other

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