PERCEPTIONS, ATTITUDES, BEHAVIORS, AND BARRIERS OF PEOPLE WITH OBESITY AND HEALTH CARE PROFESSIONALS ABOUT OBESITY AND ITS MANAGEMENT: THAILAND PERSPECTIVE FROM THE ACTION APAC SURVEY STUDY

Apussanee Boonyavarakul[*], *Supawan Buranapin*[**], *Nuntaporn Aniwat*[***], *Ratiporn Chinthammit*[***]

[*] **Division of Endocrinology, Department of Medicine, Phramongkutklao Hospital, Bangkok, Thailand**
[**] **Division of Endocrinology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand**
[***] **Department of Medical Affairs, Novo Nordisk Pharma, Bangkok, Thailand**

Abstract

Background: Obesity rates are increasing in Thailand, with their impact extending beyond the healthcare system, conferring a substantial burden on the individual, society, and the economy.

Objectives: The ACTION APAC (Awareness, Care and Treatment In Obesity Management Asia Pacific) study aimed to identify perceptions and attitudes towards obesity among people with obesity (PwO) and healthcare professionals (HCPs) in the Asia Pacific (APAC) region. Here, we report the findings of the Thailand data set.

Methods: An online, cross-sectional survey was conducted across nine countries, including Thailand, recruiting respondents (PwO, HCPs) through online, telephone, and public intercept methods. PwO participants aged 18 years and older (body mass index ≥25 kg/m²) were included based on self-reported height and weight. Eligible HCPs had over two years of direct patient care experience. Data were analyzed using descriptive statistics.

Results: In total, 1,503 PwO and 200 HCPs completed the survey. Most PwO (74%) and HCPs (92%) recognize obesity as a chronic disease; however, only 49% of PwO discussed weight with their HCP, and 51% felt weight loss was their responsibility. The primary reasons for not discussing weight included self-responsibility (PwO, 34%) and HCPs perceiving the patient as uninterested (39%). Most PwO (78%) liked HCPs discussing weight, with only 11% feeling offended. While 48% of PwO relied on the Internet for weight management information, only 28% consulted HCPs. PwO and HCPs identified a lack of exercise and unhealthy eating habits as significant barriers to weight loss and preferred a healthy diet and exercise to lose weight.

Conclusions: Recognizing that most Thai PwO appreciate HCPs initiating weight discussions presents an opportunity for proactive, open, and collaborative dialogue by HCPs. Further, there is a nationwide need to improve awareness about obesity and obesity-specific interventions to improve its management.

Keywords: ACTION APAC, Thailand, attitudes, barriers, obesity, perceptions, awareness, weight stigma, people with obesity.

Trial Registration

The trial is registered with clinicaltrails.gov: NCT05250427 (22-02-2022)

J Southeast Asian Med Res 2025: 9: e0229
https://doi.org/10.55374/jseamed.v9.229

Chinthammit R, Novo Nordisk Pharma, Thailand Ltd. Bangkok, Thailand
Email: rczq@novonordisk.com

Received: 13 September 2024
Revised: 21 April 2025
Accepted: 19 May 2025

Introduction

Obesity is a chronic, relapsing disease influenced by a complex interplay of several factors, including biological, genetic, and environmental.[1-3] Globally, approximately 988 million adults are struggling with obesity, and projections suggest that by 2035, this number will exceed 1.9 billion. In line with global trends, the prevalence of obesity in Thailand (ranking third in the Southeast Asian region) is increasing annually. As of 2020, 42% of the Thai population was classified as obese, with the average body mass index (BMI) rising from 23.9 kg/m^2 (2012) to 25.0 kg/m^2 (2018).[4-7] This trend has been primarily attributed to socioeconomic shifts driven by urbanization, resulting in changes in dietary habits and a decline in physical activity.[8, 9]

The recent Southeast Asian guidelines have recognized obesity as a chronic disease, aiming to shift the misconceptions that obesity solely results from poor lifestyle choices and to emphasize its impact beyond being viewed as a risk factor for other conditions. Lifestyle interventions, such as physical activity, exercise patterns, food consumption, and behavior modification, are the first lines of treatment recommended by Thai guidelines for managing obesity and its complications.[9] Pharmacologic treatment is an option for PwO based on BMI categories and those who exhibit better tolerance and response.[10] Bariatric surgery is only considered for those with a BMI ≥32 kg/m^2 (obesity class III) or for those with obesity-related comorbidities who fail to achieve adequate control using other methods.[11]

Despite established global and local Thai guidelines and interventions, increasing rates of PwOs across Thailand,[1, 9] there remains a limited understanding of the complex nature of obesity and a better understanding of its societal attitudes and stigmas. The literature lacks data on how PwO and HCPs approach obesity in Thailand.

The aim of the ACTION APAC (Awareness, Care, and Treatment in Obesity Management Asia Pacific) study was to identify the perceptions, attitudes, and barriers to obesity and its management among PwO and HCPs across nine South Asian countries. The primary outcomes have been previously published.[12] The Thai data were analyzed separately to gain insights, particularly given the region's diverse clinical and cultural practices. In this report, we present the results from the Thailand-specific dataset, aimed at identifying the perceptions, attitudes, and barriers to obesity care as perceived by both PwO and HCPs.

Methods

Study design and participants

The comprehensive methodology of the ACTION APAC survey has been previously reported.[12] Briefly, this was a cross-sectional, non-interventional, descriptive online survey conducted across nine countries —Bangladesh, India, Indonesia, Malaysia, Pakistan, the Philippines, Singapore, Vietnam, and Thailand — between 14 April 2022 and 23 May 2022, PWO and HCPs. All participants provided informed consent before study initiation. The study was conducted following the guidelines for Good Pharmacoepidemiology Practices,[13] and was registered under the ClincalTrials.gov (NCT03584191).

Eligible Thai PwO were ≥18 years old, with a BMI of ≥25 kg/m^2 (calculated based on self-reported height and weight), classified according to the global obesity classification criteria.[14] Key exclusions included pregnancy, prior study participation, intense fitness program involvement, or significant unintentional weight loss within the six months preceding survey

completion. Eligible Thai HCPs were medical practitioners with at least two years of practice, having attended to at least 100 patients in the past month, and spending at least 50% of their time in direct patient care. Those specializing in general plastic or bariatric surgery were excluded.

Study design and data collection

Two survey questionnaires for PwO or HCPs were developed by an international steering committee of leading experts in obesity from the participating countries. These questionnaires were then tailored for the Thai region based on feedback from a panel of Thai scientific experts. The WIRB Copernicus Group (WCG, formerly known as WIRB) and a local Thai Institutional Review Board reviewed and approved the primary survey questionnaires.

The data collection for the online survey was programmed using Decipher Survey Software (Focus Vision Worldwide Inc., Stanford, CT, USA by KJT Group). It was administered through online panels, as well as by telephone and in-person recruitment. Web-assisted pre-test interviews, lasting 60 minutes, were conducted with six PwO and six HCPs (three primary care practitioners and three specialists) to assess face validity before launching the quantitative surveys. Respondents (PwO, HCP) took the survey while speaking with a Thai moderator by telephone or in person.

Study Outcomes

The primary aim was to identify the perceptions, attitudes, and behaviors of PwO, including HCPs, toward obesity, while also understanding the barriers to effective obesity care. The survey covered a wide range of aspects, including the overall health and well-being of PwO, discussions regarding weight loss, attitudes toward obesity and its management, interactions with HCPs, the impact of obesity and weight stigma, health information sources, and socio-demographic characteristics. Responses were captured through single-item selection, multiple-item selection, and numeric responses. The 5-point Likert scales were employed to measure attitudes about obesity and weight, discussions with HCPs, weight loss barriers, and attitudes toward prescription weight loss medication and surgery.

Statistical analysis

De-identified data were summarized using descriptive statistical analyses (means, frequencies) using statistical software packages, including SPSS (IBM, version 23.0), Stata (StataCorp LLC, version IC 14.2), and Excel (Microsoft, version 365). Categorical data were presented as counts and percentages.

To minimize PwO sampling bias and ensure generalizability, a stratified outbound sample was considered based on predetermined demographic targets, including age, gender, household income, education, and within the Thai region. Sample sizes were selected based on statistical power, recruitment feasibility, and cost. Given the specific sample sizes in Thailand, around a proportion estimate of 50% were targeted to achieve a 2%-3% margin of error for PwO and 5.7%-6.9% for HCPs calculated from a standard normal (Z-) distribution with $z = 1.96$, or a 95% level of confidence.

Results

Characteristics of the study population

A total of 1,503 PwO and 200 HCPs completed the survey in Thailand, with the majority of PwO (60%) falling into the class I (BMI 25-29.9 kg/m2) obesity category, and 39% of the HCPs specializing in obesity (**Table 1**).

Readiness to Change

While two-thirds of PwO considered themselves obese, over one-third of them perceived themselves as either overweight or of normal weight (data not shown). On average, PwO made four serious attempts, yet over half regained weight after successfully maintaining weight loss for six months (Supplemental Figure 1). Furthermore, 58% of PwO believed they could lose weight if they decided on it, while PwO and HCPs considered obesity less important than other diseases (**Figure 1**). Motivation for weight

Table 1. Characteristics of the Thai study population
Table 1a. Subject: People with obesity

Variable	PwO (n=1,503)
Age, years mean (SD)	38.5 (10.9)
Female, n (%)	757 (50.4)
BMI classification*, kg/m²	
Class 1 (BMI 25 to 29.9)	906 (60.3)
Class 2 (BMI 30 to 34.9)	409 (27.2)
Class 3 (BMI 35 to 39.9)	127 (8.4)
Class 4 (BMI 40+)	61 (4.1)
Setting, n (%)	
Urban area	855 (56.9)
Suburban area	400 (26.6)
Rural	248 (16.5)
Comorbidities, n (%)	
Hypertension	352 (21.4)
Hypercholesterolemia	436 (25.2)
Eating disorder	119 (12.5)
Depression and anxiety	145 (10.2)
Cardiovascular disease	81 (6.2)
Type 2 diabetes	114 (9.4)
Pre-diabetes	217 (13.6)
Obstructive sleep apnea	121 (10.4)
Osteoarthritis	128 (10.0)
Infertility	83 (6.7)
PCOS	53 (3.7)
Others	59 (4.1)
None listed	545 (36.3)
Region n (%)	
Bangkok	486 (32.3)
Central (excluding Bangkok)	482 (32.1)
Northeastern	241 (16.0)
Northern	180 (12.0)
Southern	114 (7.6)
Income, baht/month n (%)	
< 1,500	56 (3.7)
1,500-3,000	49 (3.3)
3,001-5,000	52 (3.5)
5,001-10,000	115 (7.7)
10,001-15,000	204 (13.6)
15,001-30,000	333 (22.2)
30,001-50,000	337 (22.4)

Table 1. Characteristics of the Thai study population (Cont.)
Table 1a. Subject: People with obesity

Variable	PwO (n=1,503)
50,001-100,000	220 (14.6)
100000+	98 (6.5)
Decline to answer	39 (2.6)
Education, n (%)	
No education	73 (4.9)
Elementary level	280 (18.6)
Secondary level	480 (31.9)
Higher education (diploma, undergraduate, master's, doctorate)	668 (44.4)

Values are presented as mean (SD) or number (%).
*Data values reported are unweighted.

Table 1b. Subject: Healthcare professionals

Variable	HCPs (n=200)
Age, years, mean (SD)	40.1 (6.3)
Female, n (%)	66 (33.0)
Setting, n (%)	
Urban area	136 (68.0)
Suburban area	57 (28.5)
Rural	7 (3.5)
HCP category*, n (%)	
Internal medicine	100 (50.0)
Endocrinology/diabetology	70 (35.0)
Nutrition specialist	30 (15.0)
Years in practice, mean (SD)	10.7 (5.3)
Professional time in patient care, n (%)	75.0 (11.6)
Obesity specialists, n (%)**	78 (39.0)
Considered themselves as obesity experts, n (%)	169 (84.5)

HCP, healthcare professional; SD, standard deviation
Values are presented as mean (SD) or number (%).
*Bariatric surgeons were ineligible per pre-specified protocol criteria. **An obesity specialist is a physician who sees 50% or more of their patients for obesity.

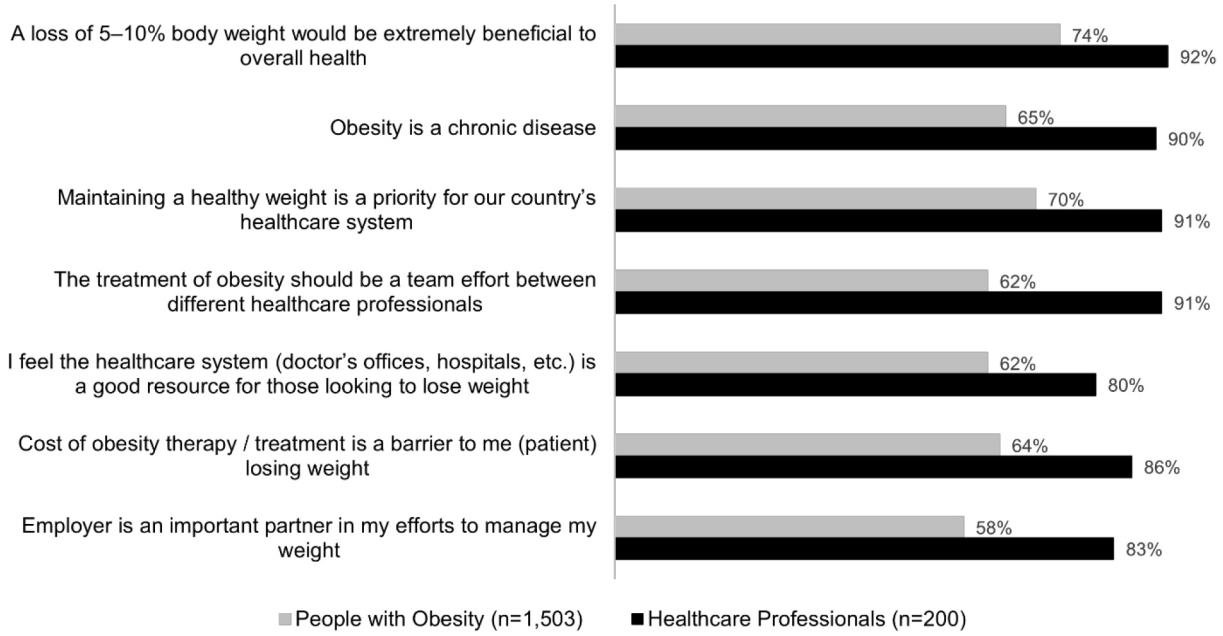


Figure 1. Attitudes towards obesity and the healthcare system

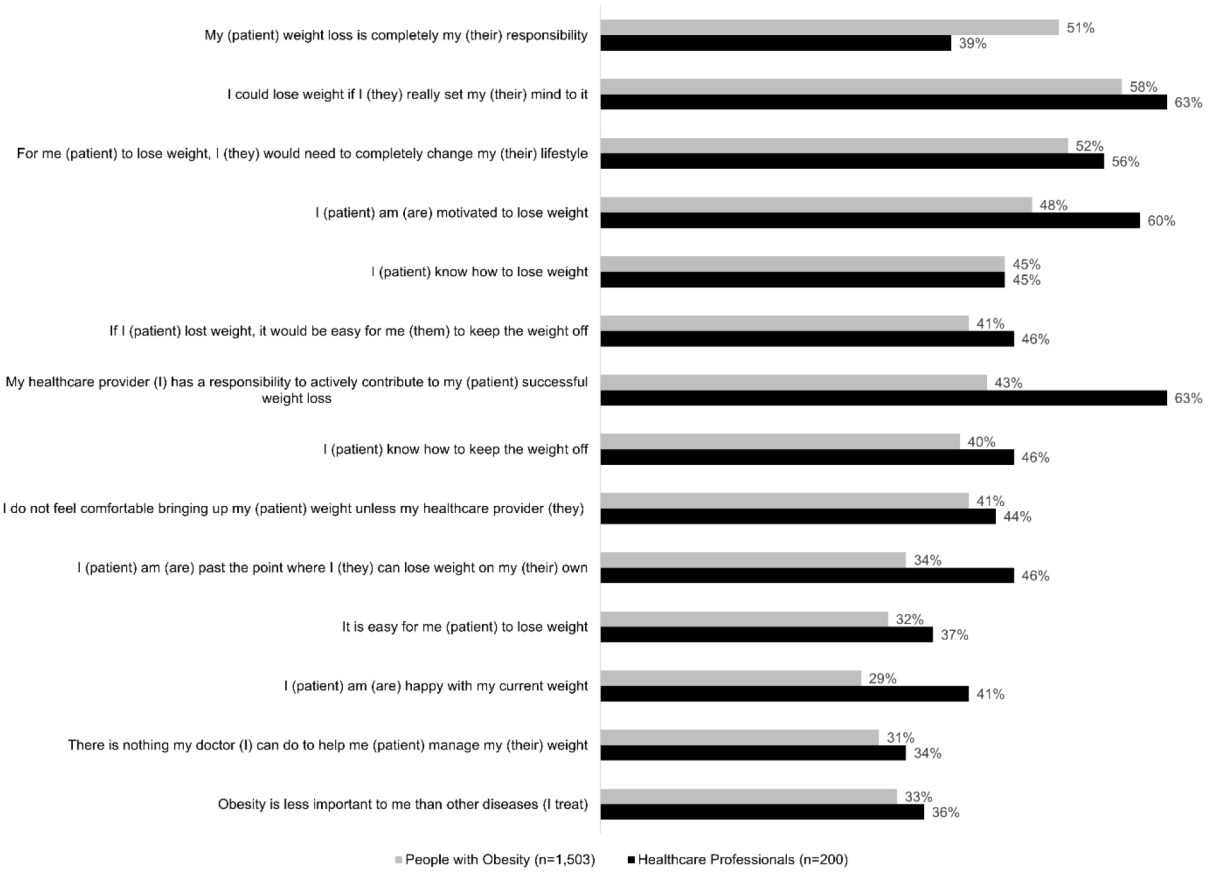


Figure 2. People with obesity and healthcare professionals' attitudes towards weight loss

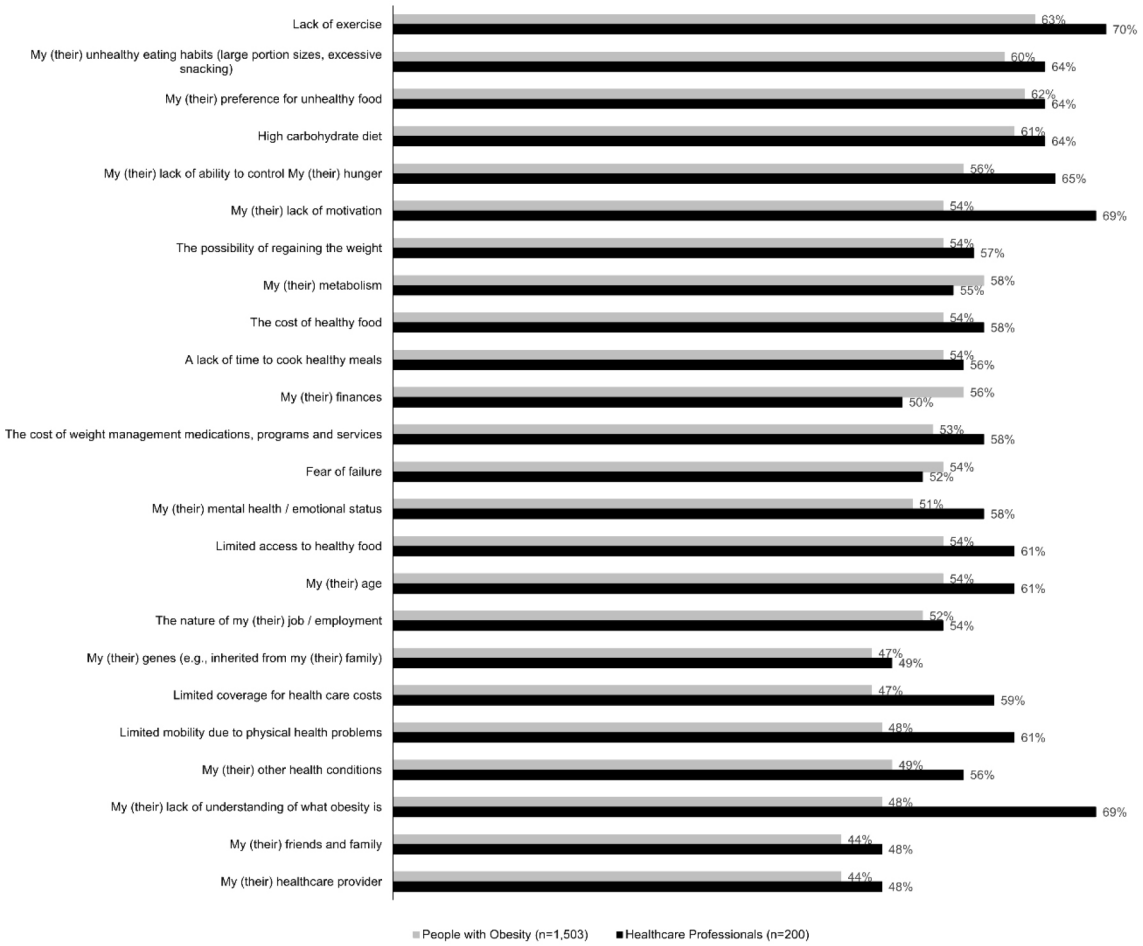


Figure 3. Barriers to weight loss

loss among PwO included a desire to feel better physically and to be in better shape. At the same time, HCPs cited support from family and personal medical events as primary motivators (**Supplemental Figure 2**).

Obesity awareness, attitudes, and perceptions

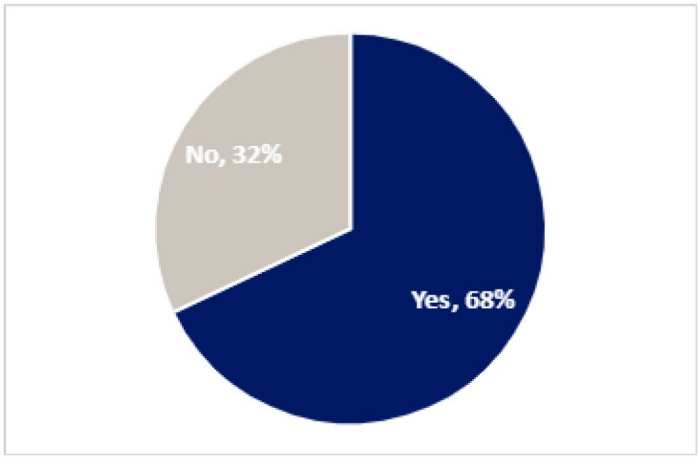
Most people with obesity (PwO) and healthcare professionals (HCPs) viewed obesity as a chronic disease. They recognized the benefits of losing 5-10% of body weight (**Figure 2**). Despite this acknowledgment, over half of PwO felt that weight loss was solely their responsibility. While 60% of HCPs believed their patients were motivated to lose weight, only 48% of PwO reported feeling motivated (Figure 1). Most PwO and HCPs identified a lack of exercise and unhealthy eating habits as the main barriers to weight loss (**Figure 3**).

PwO and HCPs shared a common perception that obesity made it somewhat harder for PwO to form romantic relationships, secure employment, and advance or get promoted at work (**Supplemental Figure 3a**). Furthermore, both groups concurred that having excess weight negatively impacts how others perceive them regarding willpower, athletic ability, or overall health (**Supplemental Figure 3b**).

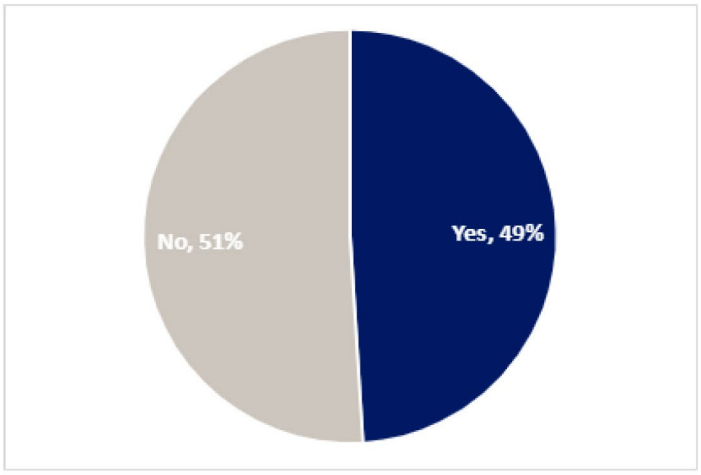
Support structure

Nearly half of PwO (48%) reported using the Internet as their primary source of information for weight management. Conversely, only 28% relied on HCPs for guidance (**Supplemental Figure 4**). One-third of PwO and HCPs felt programs for physical activity and specific meal plans are the most helpful forms of support for weight loss (**Supplemental Figure 5**)

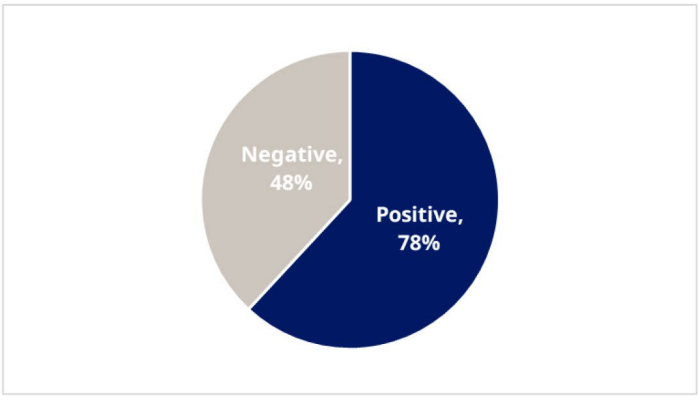
a



b



c



*Percentages do not add to 100 because respondents could select more than one condition.

Figure 4. Weight management discussions (a) People with obesity weight discussion in the past five years, (b) People with an obesity diagnosis, (c) People with obesity feelings after weight discussion*

Interactions with HCPs

Only half of PwO had discussed weight with an HCP in the past 5 years, usually with an obesity specialist. On average, it took two years from the start of their weight struggles to have this conversation (data not shown). Notably, 47% of PwO reported initiating the discussion themselves. In contrast, HCPs reported discussing weight with 61% of their PwO (**Supplemental Figure 6a**). Among those who had discussed weight, 78% felt positive. Nearly half (48%) experienced negative emotions (**Supplemental Figure 6b**). The most common reason PwO cited for avoiding weight discussions was a belief in self-responsibility, reported by 34% of PwO compared to 39% of HCPs reporting for patients uninterested in losing weight (**Figure 4**).

Among PwO who discussed their weight with an HCP (n=548), two-thirds (57%) received an obesity diagnosis. Fifty-three percent (n=200) of HCPs recorded a diagnosis in the patient's chart most or all the time, and they informed their patients of the diagnosis 61% of the time, on average. Additionally, 2% of HCPs never informed their patients of the diagnosis, and just 55% scheduled a follow-up appointment (data not shown).

Obesity management methods

The most discussed weight management methods by PwO were diet and exercise, while weight loss medications and bariatric surgery were less frequently discussed. Similarly, HCPs viewed diet, improved eating habits, and formal exercise programs as effective, with fewer HCPs perceiving weight loss medications and bariatric surgery in the same light (**Supplemental Figure 7**). When asked about prescription weight loss medications, 71% of PwO preferred to lose weight alone rather than through medications. Both PwO and HCPs expressed concerns about these medications' side effects and long-term safety, with cost being a significant barrier for both groups (**Supplemental Figure 8**).

Discussion

The Thailand cohort of the ACTION APAC study highlighted varying trends in the perceptions and attitudes toward obesity among PwO and HCPs. While most PwO and HCPs acknowledged obesity as a chronic condition, many PwO took self-responsibility for weight loss. This perception that PwO is taking full responsibility might prevent PwO from consulting HCPs to initiate a weight management dialogue. Importantly, in comparison with the global population study ACTION-IO, a lower percentage of Thai PwO (65%) perceived obesity as a chronic disease compared to the South Korean cohort (78%), (15) and a higher percentage compared to the Japanese cohort (58%). One explanation could be cultural differences, highlighting varying perceptions of obesity awareness across these datasets. Additionally, obesity and being overweight may be perceived as personal concerns rather than social issues, with weight loss seen more as an aesthetic goal rather than a response to a chronic disease (aesthetic v.s. health aspect) when compared to other chronic diseases.

Notably, one in three people with obesity (PwO) perceived their weight as either normal or overweight, despite meeting the minimum baseline body mass index (BMI) of 25 kg/m². One possible explanation could be the "weight misperception," where PwO may have a distorted perception of their weight status, potentially influenced by societal norms, personal experiences, or psychological factors. This discrepancy between perception and actual weight status is crucial when managing obesity and designing interventions for this population.

PwO and HCPs agreed that a 5-10% body weight loss benefits overall health. Effective obesity treatment necessitates a long-term, personalized, multimodal approach, considering individual beliefs, therapy expectations, and treatment goals, similar to managing other chronic diseases.[1, 16] Evidence-based counseling strategies can help initiate treatment discussions with patients.[17] PwO are likely to lose weight when HCPs follow a non-judgmental, collaborative, and person-centered approach.[18]

Thai HCPs perceived obesity as less important than other associated illnesses. Due to this perception, HCPs might not have early and effective conversations with their patients, impeding

the development of effective weight loss strategies. Moreover, PwO predominantly cited factors related to enhancing physical appearance as their main drivers for weight loss, outweighing their concerns about the potential health repercussions of obesity. This misperception might delay discussion about obesity and lead to misinformed therapeutic management, ultimately prolonging the onset of effective obesity management and consequently increasing obesity-related risks and associated comorbidities.

People with obesity typically attempt 3-4 weight loss (WL) efforts on average, and over half regain weight after a successful WL effort, with relapse occurring after at least 6 months. Following weight loss, the body undergoes various mechanisms involving neurologic, hormonal, and behavioral adaptations.[19] Some psychological and behavioral factors associated with weight regain include disinhibited eating, binge eating, increased hunger, a heightened desire to eat in response to negative emotions and stress, and dichotomous thinking, contributing to this challenge.[20] Lifestyle interventions often result in high rates of weight regain.[21] Thus, this understanding has implications for what strategies should be encouraged in treatment, highlighting the need to understand better why weight maintenance is challenging. Recognizing this challenge, HCPs should proactively take action to aid in monitoring and supporting patients in weight loss maintenance.

It is worth noting that more PwO are turning to the internet and smartphone applications rather than consulting HCPs for weight management information. This shift raises concerns about online health information's varying quality and credibility,[22] compounded by the lack of regulation in most online content.[23] This reliance on digital resources often stems from obesity-related barriers, such as the cost of private sector services, societal stigma, and the perceived ineffectiveness of HCP consultations.[24] Other common misconceptions about obesity include viewing it as a lifestyle choice rather than a medical condition, reluctance to use pharmacological treatments due to prevailing beliefs about its causes, and various body perceptions. Further, there is also a belief that bariatric surgery is an "easy way out".[25] Open and collaborative communication and the timing of this communication are crucial, as physicians play a pivotal role in initiating discussions about weight. Evidence indicates that HCP-patient engagement can effectively facilitate weight loss.[25-27]

Weight-related stigma has been well-documented in many studies.[28-30] In Thailand, PwO felt stigmatized and found it challenging to form romantic relationships, make friends, be an athlete, and be ambitious. They felt negatively judged despite their motivation to lose weight. These findings are consistent with previous studies, which have shown that PwO are likely to experience weight bias (specifically weight-based discrimination) in their daily lives across various environments (e.g., workplace, medical, societal, and neighborhood) and relationships (i.e., family, peers, and colleagues).[28, 29] Other behaviors, such as binge eating, low motivation to engage in physical activity, and low self-esteem,[31] do call for public health priority. Overall, there is an urgent need to reduce weight stigma by acknowledging weight bias, identifying biases and assumptions, practicing patient-centered communication, providing weight-friendly clinic spaces, ensuring the healthcare team's education, and increasing healthcare professionals' empathy through perspective-taking exercises.[32]

Consistent with the findings from the global population, more PwO and HCPs view lifestyle modifications as effective weight management methods. In contrast, treatment options such as weight loss medication and bariatric surgery were perceived as effective by a smaller proportion of PwO.[15, 33-35] This may not be surprising, considering Thailand's primary focus is promoting healthier eating and exercise habits.[9] The fact that PwO prefer self-directed weight loss efforts and have less inclination towards weight loss medications due to concerns about side effects and costs may also indicate a limited availability of pharmacotherapy options in Thailand, potentially influencing HCPs' perceptions of evidence-based treatments. However, it is worth noting that the safety of most anti-obesity medications has been established, with defined

adverse events offering guidance for HCPs in selecting the most suitable weight loss medications for eligible patients.[36, 37] In summary, these findings underscore the importance of enhancing education for healthcare professionals (HCPs) and ensuring they provide the most effective treatments tailored to patients' specific conditions, while being aware of the latest data and strategies for weight management.

The ACTION Thailand study is a first-of-its-kind study examining perceptions and attitudes towards obesity and its management in Thailand, involving PwO and HCPs. The study involved a large number of respondents. It employed rigorous scientific design and implementation of the survey, including stratified sampling to ensure a cohort closely representative of the Thai population. Limitations of this study include its cross-sectional and descriptive nature and the self-reported responses of PwO and HCPs to the survey questions, which may not accurately reflect all patients' scenarios. The self-reported height and weight may lead to underestimating respondents' body mass index (BMI). However, rigorous quality control measures were implemented to remove outliers. Furthermore, the significant number of urban respondents may not fully represent rural areas, limiting generalizability to the broader Thai population, a known limitation of this type of survey-based study.[35] Nevertheless, this research can provide additional insights into PwO perceptions in an under-researched region.

Conclusion

Overall, the findings of the Thai study reveal gaps in the perceptions and attitudes of PwO and HCPs towards obesity and its management, highlighting a limited understanding of this condition; this might enable a need for improved education of both groups concerning the biological basis of obesity and challenging the perception that it can be self-managed. HCPs initiating conversations earlier and actively engaging with the patients might help reduce the potential barriers to effective obesity care. A comprehensive approach is needed in Thailand to build knowledge, skills, and confidence for effective weight management.

Declarations

Ethics approval and consent to participate

The survey questionnaire items were reviewed by the WIRB-Copernicus Group (WCG) Institutional Review Board and subsequently approved by the Central Institutional Review Boards, ensuring adherence to local regulations. All respondents provided informed consent prior to the initiation of the study.

Availability of data and materials

The data supporting this study's findings are available from the corresponding author upon reasonable request.

Competing interests

AB and SB declared no potential conflicts of interest concerning this research, authorship, and/or publication. NA and RC are Novo Nordisk employees.

Funding

Novo Nordisk Health Care funded this study.

Authors' contributions

RC and NA conceived and designed the study. AB, SB, RC, and NA analyzed the data. All authors critically reviewed the manuscript. All authors read and approved the final manuscript.

Acknowledgements

Rekha Raghuram, MSc, Adv, diploma in clinical research of Novo Nordisk India Pvt Limited, Global Medical Affairs, Bengaluru, India, provided medical writing support. The authors thank Anil Dandu, PhD, from Novo Nordisk Global Business Service India, for reviewing this manuscript. The authors thank Lynn Clement, Nick Henderson, Peg Jaynes, and Andrea Stoltz of KJT Group for data collection and analysis.

References

1. Wharton S, Lau DCW, Vallis M, Sharma AM, Biertho L, Campbell-Scherer D, et al. Obesity in adults: a clinical practice guideline. Can Med Assoc J 2020; 192: E875-E91.

2. Nicolaidis S. Environment and obesity. Metab 2019;100:153942.
3. Masood B, Moorthy M. Causes of obesity: a review. Clin Med 2023; 23: 284-91.
4. Sakboonyarat B, Pornpongsawad C, Sangkool T, Phanmanas C, Kesonphaet N, Tangthongtawi N, et al. Trends, prevalence and associated factors of obesity among adults in a rural community in Thailand: serial cross-sectional surveys, 2012 and 2018. BMC Public Health 2020; 20: 850.
5. Limpawattana P, Panitchote A, Tangvoraphonkchai K, Suebsoh N, Eamma W, Chanthonglarng B, et al. Delirium in critical care: a study of incidence, prevalence, and associated factors in the tertiary care hospital of older Thai adults. Aging Ment Health 2016; 20: 74-80.
6. Thailand faces rising obesity rates, experts call for systemic change. The Nation. 2025 [updated 04 March 2025. Available from: https://www.nationthailand.com/health-wellness/40047013.
7. Thailand's leadership in the fight against obesity World Health Organization 2025 [updated 07 March 2025. Available from: https://www.who.int/thailand/news/feature-stories/detail/thailand-s-leadership-in-the-fight-against-obesity
8. Jitnarin N, Kosulwat V, Rojroongwasinkul N, Boonpraderm A, Haddock CK, Poston WSC. Risk factors for overweight and obesity among Thai adults: Results of the National Thai Food Consumption Survey. Nutrients 2010; 2: 60-74.
9. Obesity W. Thailand policies, interventions and actions [Internet]. 2020. Available from: https://data.worldobesity.org/country/thailand-214/actions.pdf
10. Tham KW, Abdul Ghani R, Cua SC, Deerochanawong C, Fojas M, Hocking S, et al. Obesity in South and Southeast Asia-A new consensus on care and management. Obes Rev 2023; 24: e13520-e.
11. Techagumpuch A, Pantanakul S, Chansaenroj P, Boonyagard N, Wittayapairoch J, Poonthananiwatkul T, et al. Thai Society for Metabolic and Bariatric Surgery Consensus Guideline on bariatric surgery for the treatment of obese patients in Thailand. J Med Assoc Thai 2020; 103: 300-7.
12. Tham KW, Ahmed A, Boonyavarakul A, Garcia MM, Guajardo M, Hanipah ZN, et al. ACTION APAC: Understanding perceptions, attitudes and behaviours in obesity and its management across South and Southeast Asia.n/a(n/a): e12644.
13. Public Policy Committee ISoP. Guidelines for good pharmacoepidemiology practice (GPP). Pharmacoepidemiol Drug Saf 2016; 25: 2-10.
14. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet (London, England) 2004; 363: 157-63.
15. Lim S, Oh B, Lee SH, Kim YH, Ha Y, Kang JH. Perceptions, attitudes, behaviors, and barriers to effective obesity care in South Korea: Results from the ACTION-IO Study. J Obes Metab Syndr 2020; 29: 133-42.
16. Grannell A, Fallon F, Pournaras D, le Roux CW. Exploring patient beliefs and perceptions regarding obesity as a disease, obesity causation and treatment. Ir J Med Sci 2021; 190: 163-8.
17. Jensen MD, Ryan DH, Apovian CM, Ard JD, Comuzzie AG, Donato KA, et al. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. Circulation 2014; 129: S102-S38.
18. Elmaleh-Sachs A, Schwartz JL, Bramante CT, Nicklas JM, Gudzune KA, Jay M. Obesity management in adults: A review. *J Am Med Assoc* 2023; 330:2000-15.
19. Ochner CN, Barrios DM, Lee CD, Pi-Sunyer FX. Biological mechanisms that promote weight regain following weight loss in obese humans. Physiol Behav 2013; 120: 106-13.
20. Elfhag K, Rössner S. Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. Obesity reviews. Int J Obs 2005; 6: 67-85.

21. Sarwer DB, von Sydow Green A, Vetter ML, Wadden TA. Behavior therapy for obesity: where are we now? *Curr Opin Endocrinol Diabetes Obes* 2009; 16: 347-52.
22. Moorman EL, Warnick JL, Acharya R, Janicke DM. The use of internet sources for nutritional information is linked to weight perception and disordered eating in young adolescents. Appetite 2020; 154: 104782.
23. Tonsaker T, Law S, Ormel I, Nease C, Bartlett G. Engaging caregivers: exploring perspectives on web-based health information. Fam Pract 2016: cmw084.
24. Gunther S, Guo F, Sinfield P, Rogers S, Baker R. Barriers and enablers to managing obesity in general practice: A practical approach for use in implementation activities. Qual Prim Care 2012; 20: 93-103.
25. Bays HE, Golden A, Tondt J. Thirty Obesity Myths, Misunderstandings, and/or Oversimplifications: An Obesity Medicine Association (OMA) Clinical Practice Statement (CPS) 2022. Obesity Pillars 2022; 3: 100034.
26. Jackson SE, Wardle J, Johnson F, Finer N, Beeken RJ. The impact of a health professional recommendation on weight loss attempts in overweight and obese British adults: a cross-sectional analysis. BMJ Open 2013; 3: e003693.
27. Kahan SI. Practical strategies for engaging individuals with obesity in primary care. Mayo Clin Proc 2018; 93: 351-9.
28. Durso LE, Latner JD. Understanding self-directed stigma: development of the weight bias internalization scale. Obesity 2008; 16
29. Lillis J, Luoma JB, Levin ME, Hayes SC. Measuring weight self-stigma: the weight self-stigma questionnaire. Obesity 2010; 18: 971-6.
30. Lin C-Y, Tsang HWH. Stigma, health and well-being. Int J Environ Res Public Health 2020; 17: 7615.
31. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. Am J Public Health 2010; 100: 1019-28.
32. Ginsburg BM, Sheer AJ. Destigmatizing obesity and overcoming inherent barriers to obtain improved patient engagement [Internet]. Treasure Island (FL): StatPearls Publishing; 2024. Available from: https://www.ncbi.nlm.nih.gov/books/NBK560733/
33. Tham KW, Ahmed A, Boonyavarakul A, Garcia MM, Guajardo M, Hanipah ZN, et al. Action APAC: understanding perceptions, attitudes and behaviours in obesity and its management across South and Southeast Asia. Clin Obes 2024; 14: e12644.
34. Iwabu M, Yamauchi T, Shimomura I, Eguchi K, Ogawa Y. Perceptions, attitudes and barriers to obesity management: Japanese data from the ACTION-IO study. J Diabetes Investig 2021; 12: 845-58.
35. Caterson ID, Alfadda AA, Auerbach P, Coutinho W, Cuevas A, Dicker D, et al. Gaps to bridge: Misalignment between perception, reality and actions in obesity. Diabetes Obes Metab 2019; 21: 1914-24.
36. Yanovski SZ, Yanovski JA. Long-term drug treatment for obesity: A systematic and clinical review. *J Am Med Assoc* 2014; 311: 74-86.
37. Khera AV, Emdin CA, Drake I, Natarajan P, Bick AG, Cook NR, et al. Genetic risk, adherence to a healthy lifestyle, and coronary disease. *N Engl J Med* 2016; 375: 2349-58.