



ACTION Teens: Perceptions and attitudes towards obesity among adolescents living with obesity, caregivers and healthcare professionals in South Korea

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ABSTRACT

Background: In South Korea, the prevalence of adolescents living with obesity (ALwO) is rising.

Objectives: To evaluate perceptions, attitudes, behaviors, and obstacles to effective obesity care among ALwO, caregivers, and healthcare professionals (HCPs) in South Korea.

Methods: ACTION Teens (NCT05013359) was a multinational, cross-sectional survey conducted in 2021. Data from South Korean participants are reported (476 ALwO, 523 caregivers, 200 HCPs).

Results: Most ALwO/caregivers acknowledged that they/their ALwO had overweight, obesity or severe obesity (95%/88%, respectively) and were concerned about weight impacting their/their ALwO's future health (94%/91%, respectively). The predominant information source on weight management for ALwO/caregivers was YouTube (62%/35%, respectively).

Most HCPs (87%) indicated obesity had a strong impact on overall health; fewer ALwO (70%) and caregivers (62%) provided the same responses. ALwO recognized the societal challenges associated with overweight/obesity (versus healthy weight), with 50%, 37%, and 36% reporting that overweight/obesity makes it harder to get a job, make friends, and perform well at school, respectively (compared with 41%, 28%, and 26% of caregivers). A higher proportion of ALwO (80%) than caregivers (45%) thought weight loss was completely the ALwO's responsibility. While 82% of ALwO reported they had made a recent weight-loss attempt, only 60% of caregivers reported that their ALwO had made a recent weight-loss attempt; HCPs thought that, on average, 35% of their ALwO patients had attempted to lose weight.

Conclusions: Disparities in respondents' perceptions and attitudes toward obesity underscore the need for enhanced communication and increased understanding of obesity to improve healthcare strategies for South Korean ALwO.

1. Introduction

The increasing prevalence of childhood and adolescent obesity has emerged as a challenge that is impacting global health [1]. This growing problem is compounded by the fact that adolescent obesity often persists into adulthood, leading to significant and long-lasting health

implications [2]. The prevalence of adolescent obesity in South Korea has increased in recent years, from 5.6% in 2005–2007 to 7.8% in 2014–2016, and reaching 13.5% in 2021 [3]. Socio-environmental factors, such as family, education, and community, are important risk factors for the development of obesity in adolescents [4]. In addition, social and environmental changes, including a perceived stigma

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surrounding overweight/obesity in South Korean culture, may have impacted the health behavior of adolescents in South Korea, resulting in heightened interest in appearance, health, and weight [5].

Obesity in adolescents is intricately linked with burden on mental health and impacts overall well-being [2,5–7]. However, there is a lack of research focused on understanding experiences of obesity care, the barriers to care and the requirements for effective weight management among adolescents living with obesity (ALwO), their caregivers and healthcare professionals (HCPs).

To address this, the international Awareness, Care and Treatment In Obesity management (ACTION) Teens study was conducted with the primary objective of understanding the perspectives, attitudes, behaviors, and obstacles related to providing effective obesity management among ALwO, their caregivers, and HCPs [8]. This article presents findings from the ACTION Teens study in the subset of participants from South Korea.

2. Materials and methods

2.1. Study design and participants

ACTION Teens was a cross-sectional survey study that collected data in 10 countries (Australia, Colombia, Italy, Mexico, Saudi Arabia, South Korea, Spain, Taiwan, Turkey, and the UK). The full methods have been previously published [8]. Participants from South Korea completed the survey between August and December 2021.

Eligible adolescents lived in South Korea, were aged 12 to ≤ 18 years, had obesity (defined as having a current body mass index (BMI), which was calculated based on self-reported age/height/sex/weight, in the ≥ 95 th percentile specific to their age and sex [9]). Eligible caregivers were ≥ 25 years old, resided with an ALwO in South Korea for $\geq 50\%$ of the time, and participated in the ALwO's healthcare decisions. Eligible HCPs were practicing in South Korea, had ≥ 2 years of clinical practice experience, dedicated $\geq 50\%$ of their time to direct patient care, and treated a minimum of 10 ALwO per month.

All ALwO (and their parents/legal guardians), caregivers, and HCPs gave informed consent for participation in the study. For South Korea, the study was approved on July 27, 2021, by the Institutional Review Board of WCG (Puyallup, WA, USA; Institutional Review Board tracking number: 20212733) [8]. ACTION Teens was conducted per the principles of the Declaration of Helsinki and was registered with ClinicalTrials.gov (NCT05013359).

2.2. Survey development

Separate surveys (one per respondent group) with overlapping topics were created for the study, with the assistance of an international external steering committee comprising subject matter experts and HCPs. The full surveys were published previously [8]. As previously described, the surveys included a variety of question types with participants required to answer questions using “Yes/No” options; select points on Likert scales (such as: “strongly disagree” to “strongly agree”; “not at all likely” to “extremely likely”; “very negative impact” to “very positive impact”; “never” to “always”); frequency scales; single selection responses from defined lists; multiple selection responses from defined lists; and numeric responses [8].

2.3. Procedures

KJT Group Inc. (Rochester, NY, USA) was responsible for data collection. The online survey was executed using Decipher Survey Software (Forsta, Stamford, CT, USA). ALwO and their caregivers were enlisted from online databases and panels by specifically screening a stratified adult general population sample for caregivers of ALwO. To recruit the highest possible number of “matched pairs” of ALwO and caregivers, the identified caregivers of ALwO were requested to grant

permission for their ALwO to take the survey. When recruitment of matched pairs reached its maximum, non-matched respondents were recruited to achieve the target participant numbers. ALwO and caregivers were recruited by email. HCPs were identified from online physician databases and panels and recruited by email or telephone. In South Korea, the surveys were made available in Korean; ALwO and caregivers completed the survey online, whereas HCPs could complete the survey online or via a computer-assisted telephone interview. Participants were required to respond to all questions; therefore, there were no missing data within completed surveys.

2.4. Outcomes

As previously described [8], the primary outcome measures were: attitudes about obesity/people living with obesity, and beliefs regarding the impact of obesity; weight-loss attempts throughout the previous year, motivators/barriers to losing weight, and how to define successful weight loss/management; history/frequency of weight discussions, who initiates weight discussions, and who is responsible for raising the topic of weight during HCP appointments; assessment of interactions between HCPs, caregivers, and ALwO, reasons why obesity is not discussed, and frequency of diagnosing obesity and scheduling further appointments to discuss obesity and information sources for learning about healthy lifestyles, obesity and weight-loss/management. These outcome measures were evaluated using single/multiple item selections, numeric entries, or Likert scales.

2.5. Sample size

The target sample size for South Korea was 1250 respondents (ALwO: 525; caregivers: 525; HCPs: 200). Sample size was chosen to reflect the population size of ALwO in South Korea and to balance statistical power and recruitment feasibility, based on a prevalence of childhood and adolescent obesity of 15% in South Korea [10]. Sample sizes for South Korea were targeted to achieve a margin of error of 4.3% for ALwO and caregivers and 6.9% for HCPs, around a proportion estimate of 50%. The margin of error was calculated from a standard normal (Z) distribution where $Z = 1.96$, or an approximate 95% level of confidence.

2.6. Statistical analysis

De-identified data from all participants with completed surveys were analyzed by KJT Group Inc. using Excel (Microsoft, Redmond, WA, USA; Microsoft 365), Stata version IC 14.2 (StataCorp LLC, College Station, TX, USA), and SPSS version 23.0 (IBM, Armonk, NY, USA). Stata version IC 14.2 was used for adjustments for demographic imbalances to increase accuracy and applicability of the results to the broader population of South Korea. SPSS version 23.0 was used to develop the visual graphics. Data summaries were based on univariate descriptive statistics, primarily proportions of respondents for selection-based questions and mean values for numeric entry questions. Where appropriate, outliers were removed and a reduced base reported; this was decided on an individual case basis. Responses from caregivers were weighted to reflect representative targets for demographic characteristics in South Korea (for sex, age, region, household income, and education), to ensure the generalizability of results and limit selection bias.

3. Results

3.1. Participant characteristics

A total of 476 ALwO, 523 caregivers, and 200 HCPs participated in ACTION Teens in South Korea. Table 1 reports respondent demographics and BMI classification.

Although 49% of HCPs had received advanced training in obesity or

Table 1
Demographics and characteristics of South Korean respondents.

Characteristic	ALwO	Caregivers	HCPs
Full South Korean sample, <i>N</i>	476	523	200
Matched pair (ALwO and caregiver), <i>n</i> (%)	7 (1)	7 (1)	N/A
Age, years, mean (SD)	15.2 (1.3)	40.5 (7.0)	46.1 (5.8)
Female, ^a <i>n</i> (%)	207 (43)	225 (43)	82 (41)
BMI classification of ALwO ^b			
Obesity Class I	66 % (<i>n</i> = 314)	46 % (<i>n</i> = 241)	61 % (SD: 18.6)
Obesity Class II	18 % (<i>n</i> = 88)	17 % (<i>n</i> = 89)	25 % (SD: 10.2)
Obesity Class III	16 % (<i>n</i> = 74)	37 % (<i>n</i> = 193)	14 % (SD: 13.9)
BMI classification of caregivers and HCPs, ^c <i>n</i> (%)			
Underweight (<18.5 kg/m ²)	–	9 (2)	10 (8)
Healthy weight (18.5–24.9 kg/m ²)	–	280 (54)	60 (45)
Overweight (25.0–29.9 kg/m ²)	–	162 (31)	40 (30)
Obesity Class I–III (≥30.0 kg/m ²)	–	72 (14)	22 (17)

Percentages may not sum to 100 % due to rounding.

ALwO: adolescents living with obesity; BMI: body mass index; HCP: healthcare professional; N/A: not applicable; SD: standard deviation.

Table adapted from Halford JCG, Bereket A, Bin-Abbas B, Chen W, Fernández-Aranda F, Garibay Nieto N, et al. Misalignment among adolescents living with obesity, caregivers, and healthcare professionals: ACTION Teens global survey study. *Pediatr Obes* 2022;17(11):e12957. <https://doi.org/10.1111/ijpo.12957>.

^a Proportion of female respondents is based on ALwO/caregiver Q5 (were you born a male or female?) and HCP Q905 (are you male, female, or other?).

^b BMI classification of the ALwO surveyed, the caregiver's ALwO and the HCPs' ALwO patients (Obesity Class I = BMI ≥95th percentile for age and sex; Obesity Class II = BMI ≥120 % of 95th percentile for age and sex; Obesity Class III = BMI ≥140 % of 95th percentile for age and sex). ALwO/caregiver data are the proportion (number) of ALwO; HCP data are the mean proportion (SD) of their adolescent patients with obesity.

^c *n* = 132 for BMI classification of HCPs. Caregivers' and HCPs' BMIs were categorized using the BMI values shown in the table, as opposed to the South Korean definitions for underweight, healthy weight, overweight, and obesity. In South Korea, "Obesity Class I" is the same as "Overweight" in other countries (BMI range starts at 25.0 kg/m²), "Obesity Class II" is the same as "Obesity Class I" in other countries, and "Obesity Class III" is the same as "Obesity Class II and III" in other countries.

weight management beyond medical school, only 6 % had participated in an advanced training program that lasted for more than 1 day and involved evaluation/certification.

3.2. Information sources

For information on healthy lifestyles and weight loss/management, YouTube was both the most commonly used and most important source for ALwO (used by 62 % of all ALwO; most important source for 41 % of the 441 ALwO who had used information sources); for caregivers, the most commonly used information source was YouTube (used by 35 % of all caregivers) and the most important source was social media (for 17 % of the 468 caregivers who had used information sources) (Fig. S1).

3.3. Perceptions and impact of obesity

A large proportion of HCPs indicated that obesity strongly impacts overall health and well-being (87 %), followed by 70 % of ALwO and 62 % of caregivers (Fig. 1). The majority of respondents in all groups believed that obesity has the same impact or a greater impact on health and well-being compared with several other health conditions, including heart disease, cancer, diabetes, and depression (Fig. 1).

A greater proportion of ALwO than caregivers reported that a person with overweight/obesity would find it somewhat or much harder to get a job (50 % of ALwO and 41 % of caregivers), make friends (37 % of ALwO and 28 % of caregivers), and do well in school (36 % of ALwO and 26 % of caregivers) compared with someone without overweight/obesity.

Many ALwO and caregivers recognized that they/their ALwO's weight was "a lot above" normal (i.e., obesity; 45 % and 66 %, respectively) or "extremely above" normal (i.e., severe obesity; 25 % and 10 %, respectively) (Fig. 2). Many ALwO reported that their weight makes them unhappy (38 % always; 27 % often), whereas a lower proportion of caregivers thought that their ALwO's weight made them unhappy (13 % always; 30 % often). Although 49 % of ALwO reported they are never satisfied with their weight and 53 % never felt they weigh the right amount for their height, the proportion of caregivers who thought their ALwO felt this way was lower (26 % and 28 %, respectively). In terms of level of worry about weight, most ALwO (92 %) were at least somewhat worried, with approximately half (55 %) very or

extremely worried; 91 % and 53 % of caregivers provided the same responses about their ALwO's level of worry (Fig. 2). The majority of ALwO and caregivers were at least a little worried that their/their ALwO's weight could affect future health (94 % and 91 %, respectively) (Fig. 2).

3.4. Weight-loss attempts and motivations

Most ALwO reported that they had tried to lose weight over the past year (82 %); fewer caregivers reported this for their ALwO (60 %) (Fig. 3). HCPs felt that, on average, only 35 % of their ALwO patients had made a serious weight-loss attempt in the past year.

While 80 % of ALwO agreed that their weight loss is completely their responsibility and 75 % reported that they were highly motivated to lose weight, only around half of the caregivers agreed with these statements for their ALwO (45 % and 51 %, respectively) (Fig. 3). ALwO, caregivers, and HCPs reported different key motivators for ALwO to lose weight (Fig. S2). ALwO reported that one of the greatest motivators to lose weight was not being happy with their weight (62 %); however, smaller proportions of caregivers (24 %) and HCPs (30 %) selected this as a motivator. HCPs believed the most effective motivator for ALwO was wanting to be more confident/improve self-esteem (59 %); a similar proportion of ALwO (60 %) and a smaller proportion of caregivers (28 %) selected wanting to be more confident/feel better about themselves as a motivator. Regarding successful weight loss, ALwO most often chose being able to wear a smaller clothing size (50 %) as defining success, whereas HCPs most frequently reported that maintaining target weight for 6 months or more defined success (72 %) (Fig. S3).

3.5. Weight management

Among ALwO who had discussed their weight with an HCP in the past year (*n* = 243), approximately half (48 %) had discussed weight once and 8 % had discussed weight at least five times (Fig. 4). In contrast, 30 % of caregivers who had discussed their ALwO's weight with an HCP in the past year (*n* = 422) reported that their ALwO had discussed weight with an HCP at least five times. Among all groups (ALwO who had discussed weight, caregivers who had discussed weight, and HCPs), the respondents most frequently reported that the HCP usually initiates weight discussions during appointments (40 %, 43 %, 43 %, respectively).

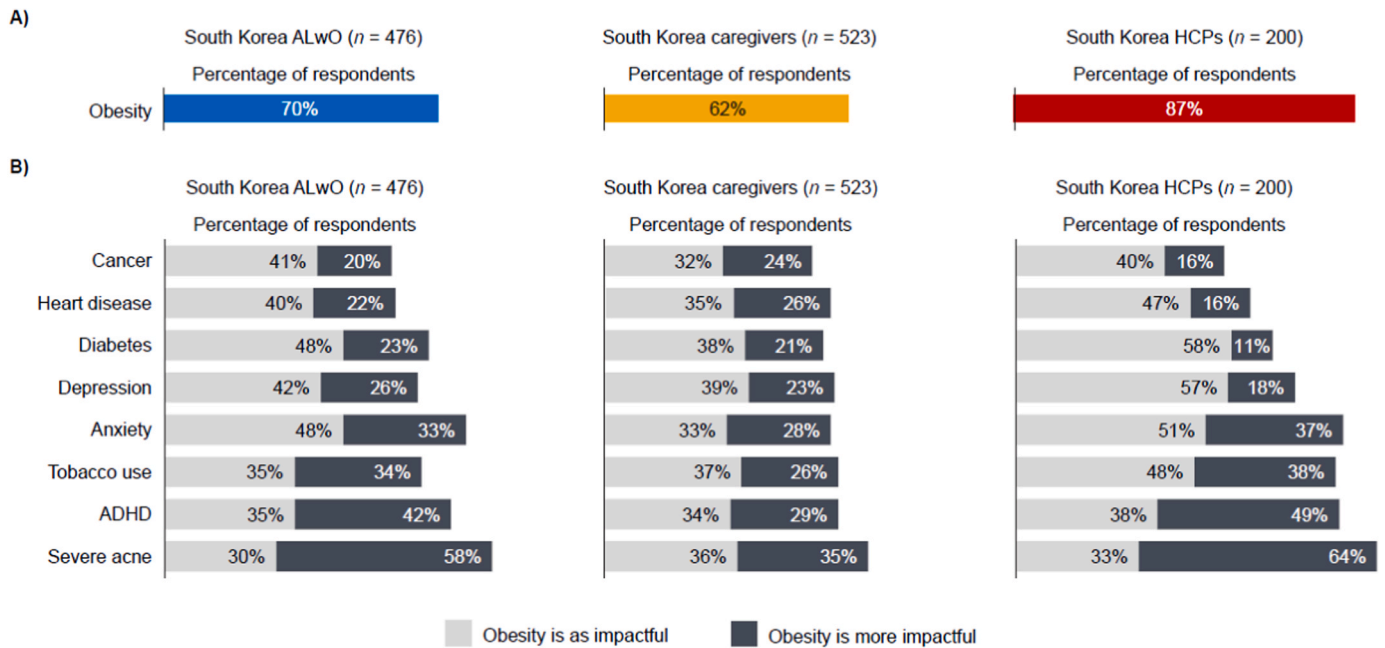


Fig. 1. Respondents' perceptions of A) the impact of obesity on overall health and well-being, and B) the impact of obesity relative to other health conditions. Respondents rated the impact they thought various conditions have on overall health and well-being using a scale from 1 to 5 (1 = no impact, 2 = slight impact, 3 = moderate impact, 4 = strong impact, and 5 = very strong impact). Panel A shows the proportion of participants who rated obesity as having a strong/very strong impact. Panel B compares participants' ratings of the impact of obesity with their ratings of the impact of other health conditions; "Obesity is as impactful" indicates participants rated the impact of obesity as higher than the impact of another health condition, and "Obesity is more impactful" indicates participants rated the impact of obesity as equal to the impact of another health condition. ADHD: attention deficit hyperactivity disorder; ALWO: adolescents living with obesity; HCP: healthcare professional. Figure adapted from Halford JCG, Bereket A, Bin-Abbas B, Chen W, Fernández-Aranda F, Garibay Nieto N, et al. Misalignment among adolescents living with obesity, caregivers, and healthcare professionals: ACTION Teens global survey study. *Pediatr Obes* 2022;17(11):e12957. <https://doi.org/10.1111/ijpo.12957>.

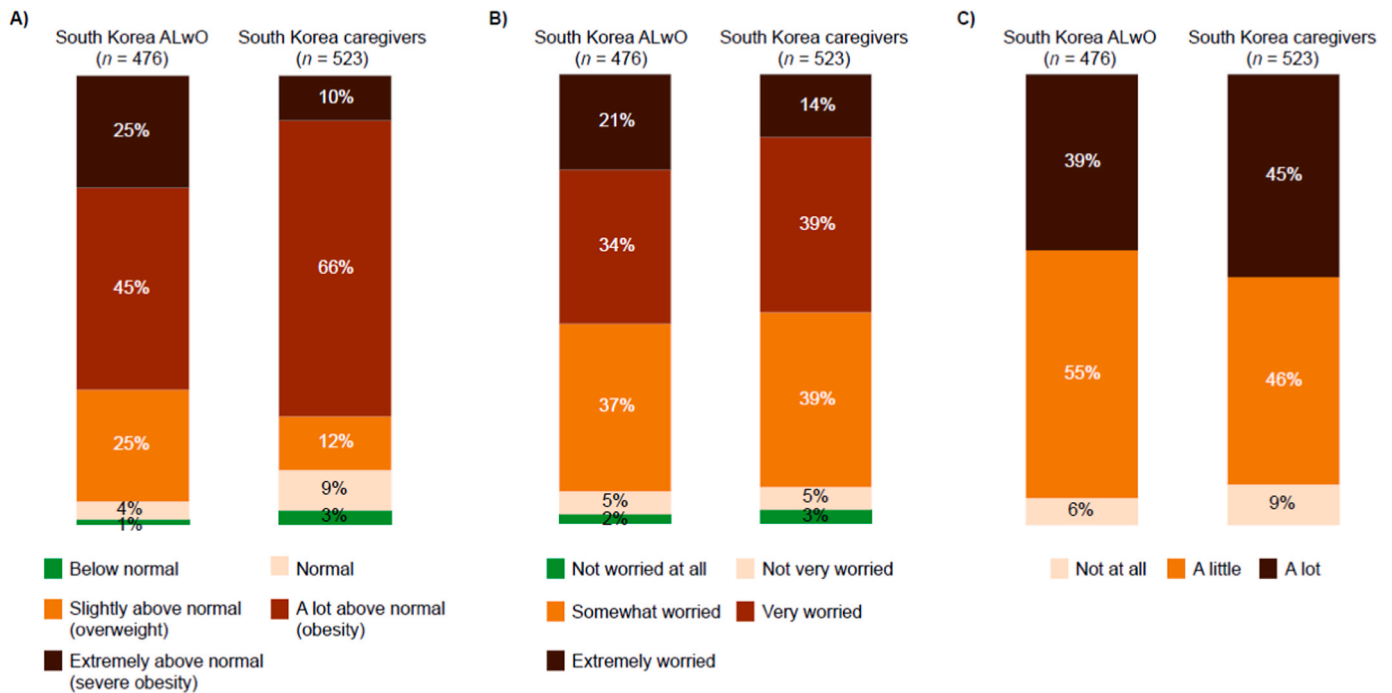


Fig. 2. ALWO's and caregiver's A) perception of ALWO's current weight, B) perception of ALWO's level of worry about weight, and C) level of worry about ALWO's weight affecting future health. The proportion of participants who selected each response option is shown, among all surveyed ALWO (left bars) and caregivers (right bars) in South Korea. Percentages may not sum to 100 % due to rounding. ALWO: adolescents living with obesity. Figure adapted from Halford JCG, Bereket A, Bin-Abbas B, Chen W, Fernández-Aranda F, Garibay Nieto N, et al. Misalignment among adolescents living with obesity, caregivers, and healthcare professionals: ACTION Teens global survey study. *Pediatr Obes* 2022;17(11):e12957. <https://doi.org/10.1111/ijpo.12957>.

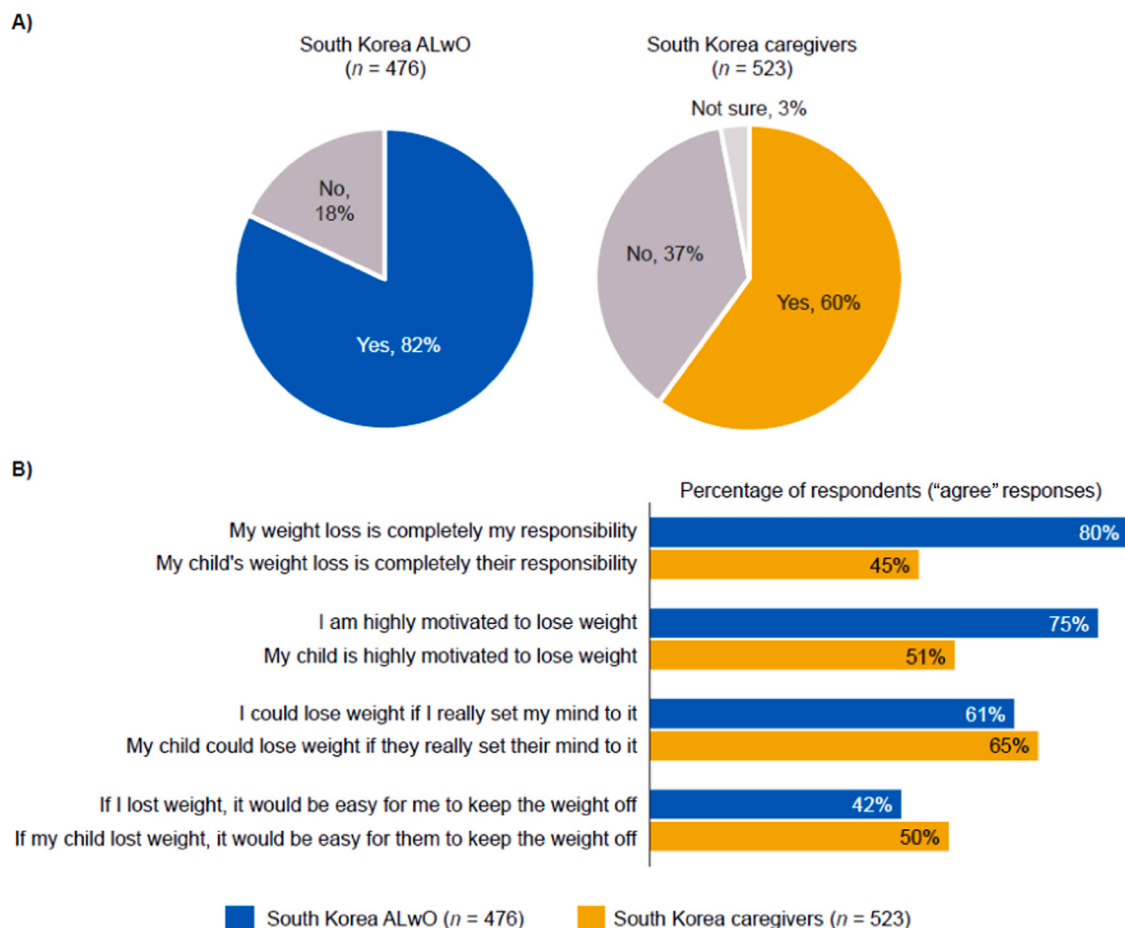


Fig. 3. ALwO's and caregiver's A) perception of ALwO weight-loss attempts in the past year and B) attitudes towards ALwO weight loss. Panel A shows the proportion of all surveyed ALwO and caregivers in South Korea who selected "yes" or "no" (or "not sure" for caregivers only) when asked if the ALwO had tried to lose weight in the past year. Panel B shows the proportion of all surveyed ALwO and caregivers in South Korea who selected "somewhat agree" or "strongly agree" for each statement. ALwO: adolescents living with obesity. Figure adapted from Halford JCG, Bereket A, Bin-Abbas B, Chen W, Fernández-Aranda F, Garibay Nieto N, et al. Misalignment among adolescents living with obesity, caregivers, and healthcare professionals: ACTION Teens global survey study. *Pediatr Obes* 2022;17(11): e12957. <https://doi.org/10.1111/ijpo.12957>.

and 58 %, respectively) (Fig. 4). However, approximately three-quarters of ALwO thought that they themselves should raise the topic of weight (72 %) (Fig. S4). Most HCPs reported feeling very or somewhat comfortable having weight discussions with their ALwO patients (65 %) and caregivers of ALwO (70 %). After their most recent conversation regarding weight with an HCP, both ALwO and caregivers reported various feelings, with positive feelings more common than negative (Fig. 4); the most common positive feelings were "motivated" (48 % of ALwO and 29 % of caregivers) and "supported" (33 % of ALwO and 28 % of caregivers), whereas the most common negative feeling was "ashamed" (37 % of ALwO and 15 % of caregivers) (Fig. 4). Most ALwO and caregivers who had recently had a discussion with an HCP regarding their/their child's weight agreed that they trust the HCP's advice on weight management (78 % and 61 %, respectively) and that the HCP listens carefully to what ALwO say about their weight (76 % and 54 %, respectively). Among all ALwO and caregivers, the most common reason for not discussing their/their ALwO's weight with an HCP was that the ALwO are aware of the steps they can take to manage their weight (reported by 28 % of ALwO and 26 % of caregivers); in addition, 26 % of ALwO and 24 % of caregivers reported that there is nothing that prevents them from discussing their/their child's weight with an HCP (Fig. S4).

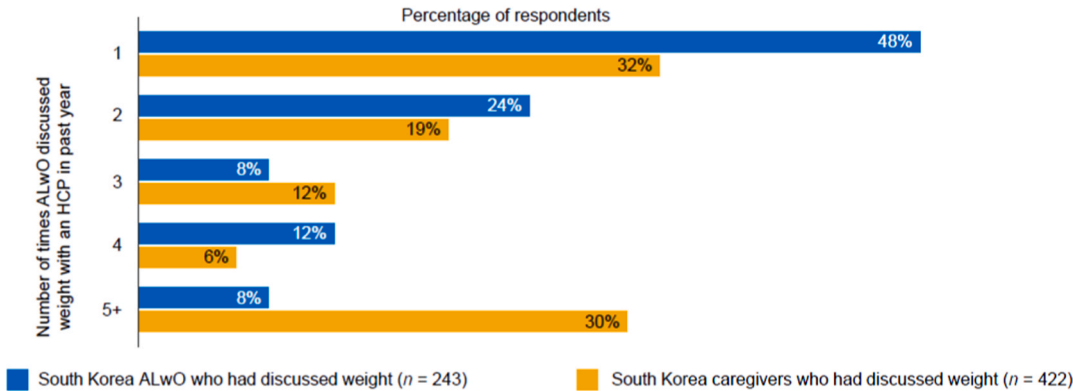
Regarding attitudes towards weight-management medications, 43 % of ALwO agreed they would feel comfortable taking medication for weight loss if their HCP recommended it; 47 % of caregivers agreed they

would feel comfortable with this for their ALwO. Attitudes towards surgery for weight loss revealed differences between respondent groups: 26 % of ALwO agreed that they would feel comfortable with having weight-loss surgery if their HCP recommended it, compared with 45 % of caregivers who agreed that they would feel comfortable with weight-loss surgery for their ALwO if recommended by their HCP.

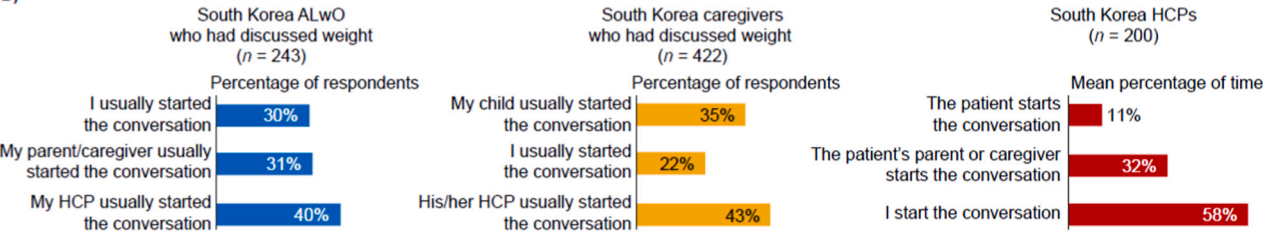
4. Discussion

Aligned with the ACTION Teens global results [8], data from South Korea reveal a need to bridge gaps in perceptions of obesity among ALwO, their caregivers, and HCPs. There was a perception among many ALwO that obesity has a large impact on health and well-being. Some ALwO and their caregivers also acknowledged that individuals with overweight/obesity face social challenges, such as difficulties in employment, forming social connections, and academic performance. This study highlights the cultural nuances of South Korea, including the social stigma regarding obesity and appearance-focused societal norms. Given these perceptions and stigma, it is important to consider the multifaceted nature of obesity, including the pivotal role that genetic, biological, and socio-environmental (such as family, community, school, and national policy) factors can play in the development of obesity [4]. For example, in South Korea, approximately three-quarters of middle school students spend time doing supplementary studying in after-school institutions [11]. Greater time spent studying after school

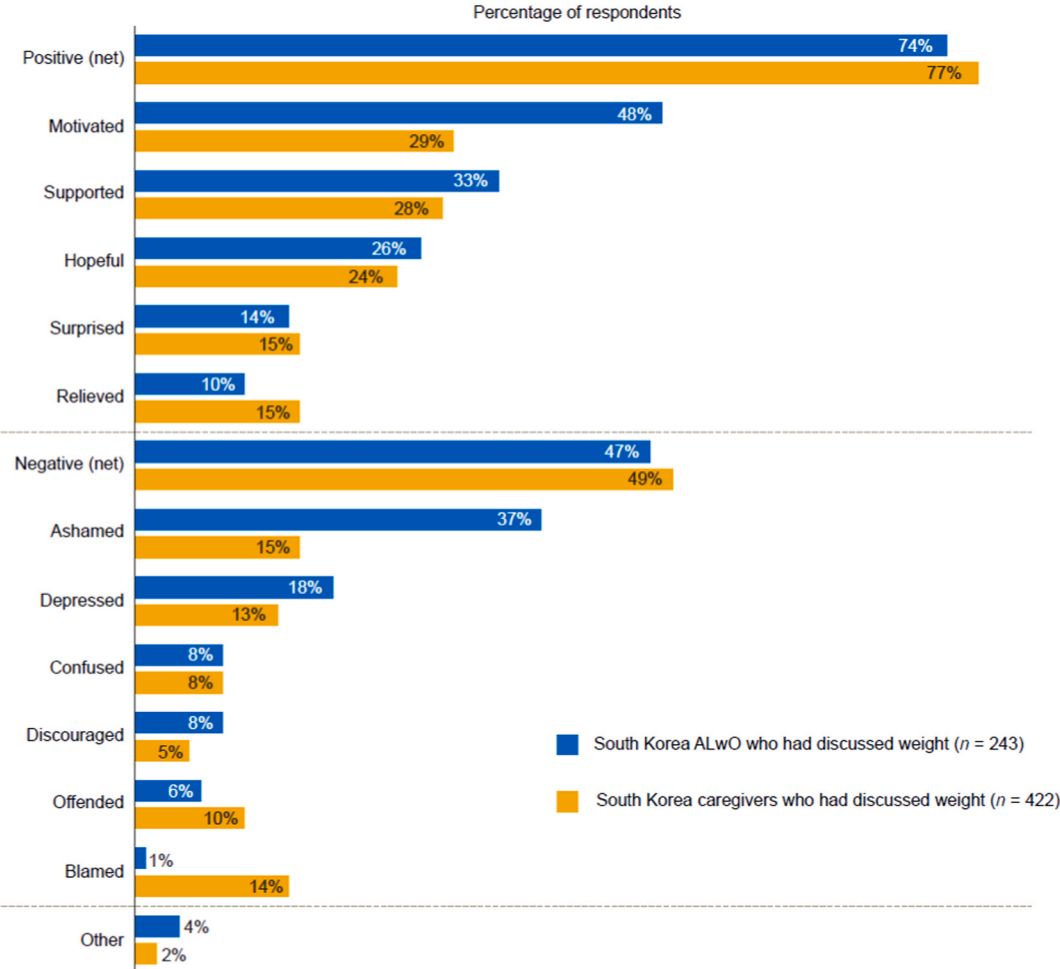
A)



B)



C)



(caption on next page)

Fig. 4. ALwO, caregiver, and HCP weight discussions: A) number of times ALwO discussed weight with an HCP in the past year, B) who initiated weight discussions, and C) feelings of ALwO/caregivers after their most recent conversation about weight with an HCP. ALwO and caregiver data are for the subset of ALwO or caregivers who had discussed their (for ALwO) or their child's (for caregivers) weight with an HCP in the past year; HCP data are from all surveyed HCPs. Panel A shows the number of times that ALwO/caregivers said that they/their child had talked with an HCP about their weight in the previous year; outliers were removed. Percentages may not sum to 100 % due to rounding. In Panel B, ALwO and caregiver data are the percentage of respondents who selected each response option when asked who usually initiated weight discussions during HCP appointments. HCPs were asked what percentage of the time each group initiates weight discussions; the mean percentage is shown. Percentages may not sum to 100 % due to rounding. Panel C shows the percentage of ALwO and caregivers who selected each response option when asked how they felt after their latest weight discussion with an HCP, with caregiver responses corresponding to their own feelings rather than how they think their child felt. Respondents were asked to select all answers that applied. Net positive = the percentage of respondents who selected ≥ 1 of the positive feelings; net negative = the percentage of respondents who selected ≥ 1 of the negative feelings. ALwO: adolescents living with obesity; HCP: healthcare professional. Figure adapted from Halford JCG, Bereket A, Bin-Abbas B, Chen W, Fernández-Aranda F, Garibay Nieto N, et al. Misalignment among adolescents living with obesity, caregivers, and healthcare professionals: ACTION Teens global survey study. *Pediatr Obes* 2022;17(11):e12957. <https://doi.org/10.1111/ijpo.12957>.

has been associated with increased risk for development of obesity in children with overweight in South Korea [12]. Increased emphasis on academic pursuits may lead to reduced engagement in physical activities; in fact, only 27.6 % of South Korean adolescents engage in robust muscle-strengthening activities more than three times per week [13]. Moreover, there has been a substantial increase in the consumption of fast food among Korean adolescents (226 % increase between 2009 and 2022 according to government surveys) [14]. These lifestyle patterns may have a direct impact on the perceptions and experiences of ALwO and their caregivers in South Korea. The rapid transition from a traditional lifestyle to a highly modernized society (characterized by reduced physical activity and poor dietary choices) in recent decades is likely contributing to increased obesity among children and adolescents in South Korea [10]. The rapid modernization of lifestyle and subsequent impact on the prevalence of obesity in South Korea may also contribute to why most South Korean ALwO acknowledged that their weight was within the obesity or severe obesity categories. This is in contrast with ALwO in other countries with modernized lifestyles, such as the UK, where 46 % of ALwO perceived their weight as normal or below normal, and Spain, where 78 % of ALwO perceived their weight to be normal or slightly above normal [15,16], suggesting that, compared with the UK and Spain, ALwO in South Korea are less likely to underestimate their weight status. The proportion of ALwO who perceived that they had severe obesity was also greater than that reported by caregivers for their ALwO. Furthermore, distinct disparity was observed between ALwO and caregivers in the perception of the ALwO's attitudes about their weight, with a greater proportion of ALwO consistently expressing dissatisfaction with their weight compared with the proportion of caregivers who perceived that their ALwO had severe obesity. Additionally, similar to results from Spain, Saudi Arabia, and Italy, a high proportion of ALwO in South Korea (80 %; 89 % in Spain, 99 % in Saudi Arabia, and 87 % in Italy) [16–18] indicated that they were concerned about the potential long-term implications of obesity for their future health, reflecting similarities in societal perceptions of obesity in different countries. Concerns about the long-term implications of obesity may also have been a contributing factor as to why most ALwO in South Korea indicated that they had made a recent weight-loss attempt. It is important to note that motivations for weight loss were not tested statistically between those who had and had not made a recent weight-loss attempt.

There was discrepancy in the proportion of South Korean ALwO and caregivers who reported that they/their ALwO had attempted to lose weight, suggesting a potential lack of communication and understanding between these groups. Linked with this, this study showed that caregivers were more likely to discuss weight with an HCP (≥ 5 times in 1 year) than ALwO. These data suggest that weight discussions between ALwO and HCPs are not as impactful as those between caregivers and HCPs. It should be noted that some ALwO had consultations with their caregiver, which may have affected results. In addition, the majority of ALwO believed weight loss to be their sole responsibility and reported they were highly motivated to lose weight, whereas fewer caregivers believed this to be true for their ALwO. These data could be linked with the relatively low proportion of South Korean HCPs reporting receiving comprehensive training in obesity management compared with their

global counterparts [8], which may have influenced the likelihood of weight discussions taking place. In the future, it will be valuable to statistically compare the likelihood of weight discussions taking place if HCPs are trained versus if they are untrained in obesity management. The lack of training also indicates a need for specialized education of HCPs to improve the treatment of obesity as a chronic disease and advocates for improved HCP training to address the unique challenges faced by South Korean ALwO. Indeed, given that ALwO and caregivers defined successful weight loss differently to HCPs, the data suggest an overall lack of awareness in South Korean society that obesity is a disease, as well as a lack of education emphasizing the value of health in adolescents. The results also suggest a misperception among ALwO and caregivers of what a healthy weight is, and, therefore, how successful weight loss should be defined. Taken together, lack of disease awareness and misperceptions may affect appropriate and recommended treatment approaches. Discussions about weight management between South Korean ALwO and HCPs may benefit from HCPs taking a more balanced and patient-centered approach, with HCPs predominantly initiating weight discussions.

This study revealed that South Korean ALwO and their caregivers considered social media platforms, particularly YouTube, and search engines as the most important information sources for weight management. The reliance on these channels raises concerns, as information gathered from these open sources may not be accurate [19] and could impact the effective management of obesity. It has previously been shown that people with low health literacy are more likely to use social media for health information than information from HCPs [19]; therefore, it is vital to recognize the limitations of these information sources and consider strategies to promote access to reliable, evidence-based resources for both ALwO and their caregivers.

Although direct comparisons are not possible given the survey nature of this study, comparative analysis of the results of the ACTION Teens global study and other individual country analyses suggests meaningful differences in perceptions and attitudes towards obesity between South Korean ALwO and their counterparts in other countries [8]. The proportion of ALwO who reported that their weight often or always makes them unhappy was greater among South Korean respondents than globally (65 % versus 44 %); the lowest proportion was observed in Italy (43 %) [8,18], and a similar proportion was observed in Saudi Arabia (59 %) compared with in South Korea [17]. Furthermore, the proportion of South Korean ALwO reporting weight-loss attempts in the past year exceeded that of global ALwO [8], as well as other individual countries (UK: 57 %; Spain: 36 %; Saudi Arabia: 70 %; Italy: 60 %) [15–18], highlighting the motivation of South Korean ALwO to lose weight despite societal barriers. This suggests that ALwO in South Korea take more responsibility for weight management than their global peers. A greater proportion of caregivers in South Korea thought their ALwO were concerned about their weight compared with their global counterparts, particularly when compared with Spain (22 %) [8,16]. These findings support the need for a tailored approach, based on the unique socio-environmental factors specific to South Korea, to improve obesity treatment among South Korean adolescents.

Strengths of this study include the evaluation of three distinct groups

– ALwO, their caregivers, and HCPs who manage adolescent obesity. In addition, the use of stratified sampling and demographic weighting of caregivers' data enhances the generalizability of this study. Limitations include the cross-sectional nature of the study, the lack of analysis of matched pair responses (due to only 1 % of South Korean ALwO and caregivers being matched pairs), and the diversity of obesity diagnostic criteria in different countries (when comparing the South Korean data with the global data). Additionally, self-reported weight and height measurements may have underestimated, or overestimated, BMI. Finally, although sex-based subgroup analyses are beyond the scope of the present article, the findings of this analysis may be less generalizable to female ALwO, given that a greater proportion of male ALwO were surveyed in South Korea.

5. Conclusions

South Korean data from the ACTION Teens study provide insights into the challenges faced by ALwO, their caregivers, and HCPs and identify disparities in perceptions and attitudes towards obesity between these groups. The findings underscore the need for tailored approaches, enhanced communication, and a comprehensive understanding of obesity as a chronic disease to inform effective healthcare strategies for ALwO in South Korea.

Author statement

Yong Hee Hong, Hyun Wook Chae, Hae Sang Lee, Eungu Kang, and Moon Bae Ahn declare no competing interests. Da Hi Kang and Min Jee Kim are employees of Novo Nordisk. Young-Jun Rhie received consultancy fees from Novo Nordisk for his role as a member of the ACTION Teens Steering Committee during the conduct of the study.

CRedit authorship contribution statement

Rhie Young-Jun: Writing – review & editing, Methodology, Conceptualization. **Kim Min Jee:** Writing – review & editing. **Hong Yong Hee:** Writing – original draft. **Chae Hyun Wook:** Writing – review & editing. **Kang Da Hi:** Writing – review & editing. **Ahn Moon Bae:** Writing – review & editing. **Kang Eungu:** Writing – review & editing. **Lee Hae Sang:** Writing – review & editing.

Ethics statement

ACTION Teens was conducted per the principles of the Declaration of Helsinki. All ALwO (and their parents/legal guardians), caregivers, and HCPs gave informed consent for participation in the study. For South Korea, the study was approved on July 27, 2021 by the Institutional Review Board of WCG (Puyallup, WA, USA; Institutional Review Board tracking number: 20212733).

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.orcp.2025.04.004](https://doi.org/10.1016/j.orcp.2025.04.004).

Data availability

Data will be shared with bona fide researchers submitting a research proposal approved by the Independent Review Board. Individual participant data will be shared in data sets in a de-identified and anonymized format. Data will be made available after research completion. Information about data access request proposals can be found at novonordisk-trials.com.

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