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ORIGINAL ARTICLE

Audit on doctors' documentation of overweight and obesity in children attending general children's outpatient's clinics in Malta

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Background

Childhood obesity is a global epidemic and Malta is no exception. Despite local awareness, not all children seen at the general hospital's children's outpatients (COP) have their height and weight measured. An audit was carried out on the documentation of overweight and obesity in children, along with any advice given in this regard.

Methods

The NICE guideline on obesity was used to define overweight and obesity. A cross-sectional study was conducted over 10 weeks between January and March 2020. Data on age, gender, weight, height, percentiles/BMI, doctor grade, presenting complaint, appointment frequency and previous anthropometric documentation were collected from clinical notes. All children attending general COP, between 2-15 years of age and free from chronic medical illnesses affecting BMI were included.

Results

In 418 patients, weight and height were documented in 64.8% and 58.1% respectively, while percentiles were documented in 17.0%. Furthermore, BMI was documented in just 1.2% of cases, and in 32% no anthropometric measurements documented whatsoever. Moreover, 29.7% of children who were previously flagged up as obese/overweight were not followed-up, and only 12% who were documented as obese, were investigated, albeit incompletely. Only 7% of known overweight children had dietary advice documented in their notes.

Conclusion

COP's services are not attaining the standard as per current guidelines, which suggest that all children should be screened for obesity opportunistically. We recommend the distribution of a dietary guidelines leaflet to parents, continuous medical education for doctors, giving sustainable advice during follow ups and the introduction of a child obesity clinic.

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Introduction

Childhood obesity is a global health problem posing significant public health challenges. This serious health issue has increased alarmingly over the past few decades, with an estimate of over 41 million children over the age of five years being overweight or obese worldwide.[1] Unfortunately, Malta is also similarly affected, as several studies repeatedly demonstrated a high prevalence of childhood overweight and obesity in this country.

In the latest Health Behavior in School Children (HBSC) report, Malta has the highest percentage of overweight and obese children in 11, 13 and 15-year-old youths.[2-3] Consequently, these children are likely to progress into overweight and obese adults, with an increased risk of developing non-communicable diseases such as hypertension, diabetes and other complications at a younger age.[4] Obesity and associated health conditions are preventable with a healthy diet, adequate daily moderate-to-vigorous physical activity and adequate sleep and, therefore, it is of outmost importance to prevent and manage obesity in children. [5-6]

The National Institute for Health and Care Excellence (NICE) has in fact provided clinical guidelines (CG189) for healthcare professionals for best practice advice on the care of adults and children who are overweight or obese.[7] The World Health Organization (WHO) defines overweight as a body mass index (BMI) of ≥85th percentile or a BMI z-score >1, and obesity is defined as a BMI ≥97th percentile or a BMI z-score >2.

The guideline advises to measure a child's height and weight opportunistically and to use BMI, which is adjusted for age and gender, as a practical estimate of adiposity and interpreted within the context of a medical history and pubertal status. Waist circumference is not recommended as a routine measure. If the child's BMI is at or above the 91st centile, tailored clinical intervention should be considered. The guideline advises to stress that obesity is a medical condition with specific health implications rather than how people look because it is important to acknowledge that some families would be unwilling to change their lifestyle and behaviour. NICE's clinical guidance advises that all children with a BMI at or above the 98th centile should be assessed for comorbidities such as hypertension, dyslipidaemia, type 2 diabetes, hyperinsulinaemia, psychosocial dysfunction and exacerbation of conditions such as asthma. Blood pressure measurement, liver profile, fasting blood glucose, oral glucose tolerance test, fasting insulin, endocrine function and HbA1c should be the first line of investigations,[8] and interpreted in the context of the degree of the child's obesity, child's age, history of comorbidities and possible genetic or metabolic causes of overweight or obesity.

Lifestyle factors should be assessed, and this includes physical activity, sedentary behaviour, diet, psychosocial distress and sleep. A family history of being overweight or obese, including associated co-morbidities should be taken, as well as the child and family's willingness and motivation to change lifestyle. In a very small proportion of children, obesity will be the result of endocrine, syndromic or monogenic causes.[9-10] Advice should be given, bearing in mind family dynamics and socio-economic background of the patient for optimal effect. Family-based intervention including dietary modifications and increased physical activity are the cornerstone of weight management in children.[11-12]

Despite the general awareness of the local situation, it was noted that not all children attending the children's outpatient's clinic at Mater Dei Hospital, who are overweight or obese, were not appropriately flagged up. As a result, these children departed from outpatient clinics without proper weight management advice or referral. In fact, childhood obesity was mostly overlooked by doctors, since the main priority during a consultation was the presenting complaint rather than the ongoing chronic process of inadequate energy balance of the child. Moreover, a specialized children obesity clinic was (and remains) not available so far, creating a public health gap despite a dire need for a central place for instituting and coordinating effective obesity management.

The aim of clinicians is to manage children holistically and, therefore, this should include appropriate weight assessment and management. This study was designed to gauge the prevalence of doctors' documentation of overweight and obesity with or without appropriate advice and referral, in the case files of children attending general Children's Outpatients. In addition, this study will provide the opportunity to raise awareness amongst doctors who, in-turn, will be able to provide patient-centered care that is sensitive to the individual's life circumstances and reduce the overall future complication rate in these patients.

METHODS

Ethics

This audit was carried out in Mater Dei Hospital (MDH) and data was collected from patients' files. Permissions from the Chief Executive Officer (CEO) of MDH, Data Protection Officer (DPO), Clinical Consultants in charge of respective clinics and from the Chairman of the Paediatric Department at MDH were obtained. Ethical approval was attained from the University of Malta, Medicine and Surgery Faculty Research Ethics Committee.

Inclusion and exclusion criteria

The list of children covered in this audit included all those children who attended general children's outpatients, between 2nd January 2020 and 16th March 2020. All children between two and fifteen years of age were included in the audit. Children younger than two years of age were excluded since they are assessed with weight for length rather than BMI and thereby could not be classified by using BMI criteria. Moreover, those children suffering from chronic medical illnesses which are uncontrolled, of a metabolic nature that affects BMI or that required use of regular systemic steroids, were also excluded from the audit.

Criterion

The NICE guideline on Obesity: identification, assessment and management (CG189), was used as the criterion to which we compare our local practice.[7]

Data Collection

A longitudinal study design was conducted over a period of ten weeks. Clinical notes of children attending general Children's Outpatient's department between the 2nd January 2020 and 16th March 2020, and meeting the inclusion criteria, were perused. The information collected from the files was inputted on a spreadsheet that was only accessible between researchers. The data was carefully stored and password protected.

The notes were reviewed and analyzed for the documentation of age, gender, weight, height, BMI and height and weight percentiles. Thereafter, if the child was overweight or

obese, documentation of advice given (if any), any referral or further clinical assessment and investigations specifically in view of the increased weight, was noted. The presenting complaint and whether the child suffered from an underlying medical problem associated with obesity was also noted from the clinical notes. This was done to make sure the exclusion criteria were met. Appointment frequency of COP attendance was also collected and whether there were previous anthropometric readings documented. This data was collected to determine the multiple opportunities paediatric clinicians had at their disposal to identify children who were overweight or obese, and provide re-enforcing advice on its' management.

Growth reference charts

The WHO Growth Standards for 0-5 years and the 2007 WHO child growth reference charts for 5-19 years were used for this study.[13-14] Anthroplus software (WHO) was used to convert height, weight, age and gender into BMI-for-age. According to WHO, for children 2 to 19 years of age, the cutoff for overweight body mass index (BMI) is the 85th percentile or above, or a BMI z-score greater than 1, and the cutoff for obese BMI is the 97th percentile or above, or a BMI z-score greater than 2. Normal weight is a BMI between the 2nd percentile to the 84th, or a BMI z-score between -1 to <1. The cutoff for underweight is a BMI below the 2nd percentile, or a BMI z-score below -1.

Statistical analysis

Data analysis was conducted with IBM SPSS v25, 64-bit edition for Windows (SPSS Inc., Chicago, IL). Descriptive statistics were used to detail current prevalence of documented children with overweight or obesity. Independent samples t-test was used to compare means between independent groups. One-way analysis of variance (ANOVA) with Bonferroni adjustment were used to determine whether there are any statistically significant differences between the means of three or more independent groups.

RESULTS

A total of 628 patients had appointments at 45 general Children's Outpatients (COP) clinics between 2nd January and 16th March 2020. 123 (19.6%) patients did not turn up for their appointment, 87 patients were under 2 years of age and hence did not meet the inclusion criteria, and 8 patients were excluded due to chronic/metabolic illness. A total of 418 patients were included in this study. The majority were male (58.1%) and the mean age of the patients was 8.83 years (SD=3.78) (Table 1).

89.2% of the patients attending general COP had Maltese citizenship. The average number of appointments per patient was 7.05 (SD=8.54) appointments, with a median number of 3 appointments. This spanned a period of few months to several years.

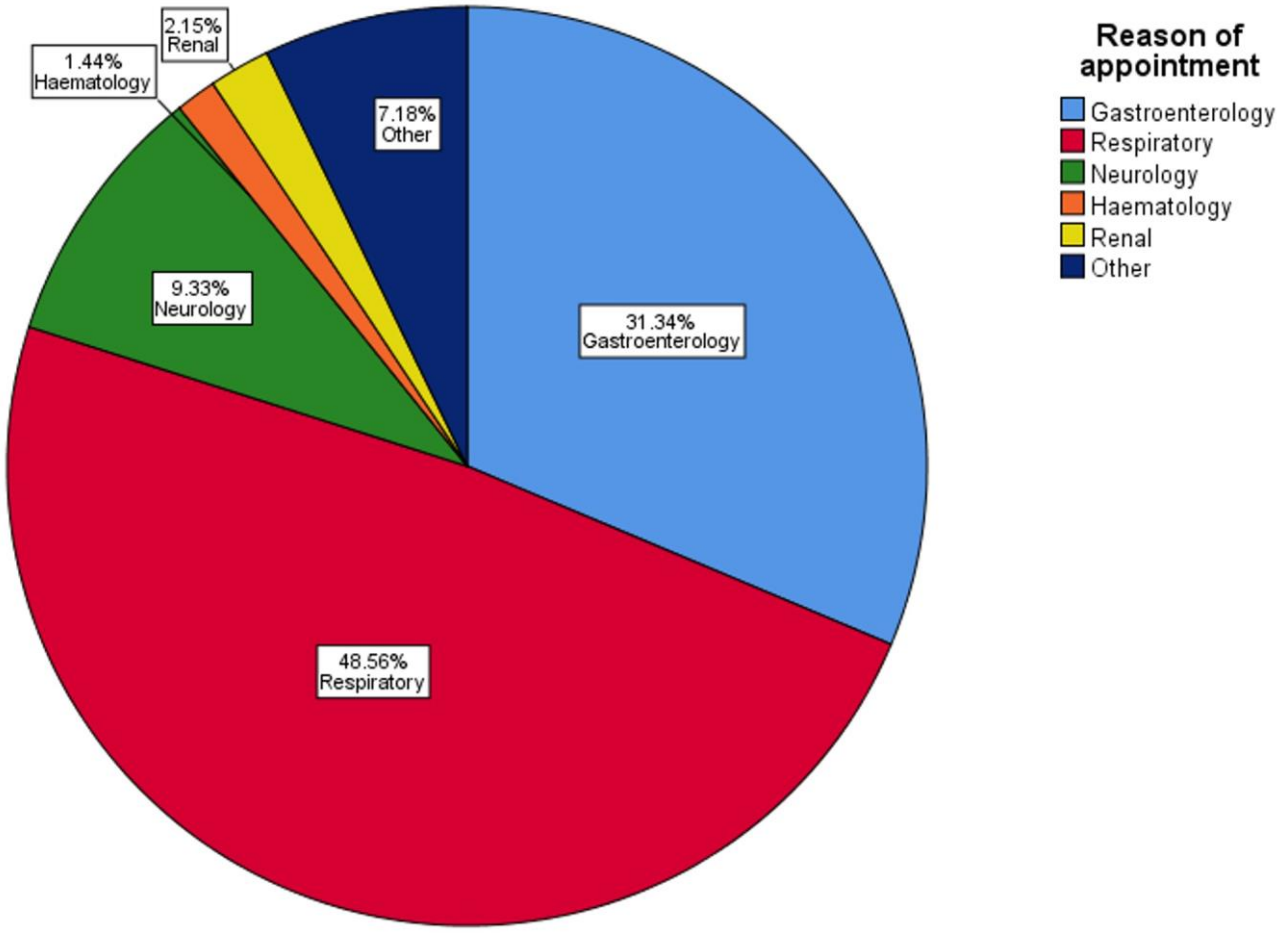
Respiratory issues were the main reasons for the appointments at general COP followed by gastroenterology and neurology issues (Figure 1).

The top five main issues for COP attendance were asthma (34.4%), viral wheeze (11.5%), abdominal pain (10.8%), headaches (4.5%) and Coeliac disease (2.9%), diarrhoea (2.9%) and constipation (2.9%). Of those with documented anthropometry, a third of asthmatics and a fourth of children complaining of abdominal pain were found to be overweight and obese.

Table 1 Descriptive statistics of included children attending general children outpatient's clinics between 2nd January 2020 and 16th March 2020

	Males	*Females*	*Group differences p-value*
N	243 (58.1%)	175 (41.9%)	
Age mean (years)	8.89 (SD=3.77)	8.66 (SD=3.67)	
BMI percentile mean	67.28 (SD=34.03)	70.58 (SD=31.18)	0.441
BMI z-score	0.978 (SD=1.90)	0.946 (SD=1.54)	0.888

Figure 1 Reason for appointment at general children's outpatient's clinic



The majority of patients were seen by the consultants (38.5%), followed by higher specialist trainees (HSTs) (29.4%), resident specialists (RSs) (16.0%), general practitioners/medical officers (9.1%) and basic specialist trainees (BSTs) (6.9%).

Height was documented in 243 patients (58.1%) and weight in 271 patients (64.8%) of appointments. The following bar graphs are a representation of the proportion of documented height and weight by doctor grade (Figures 2 and 3).

As shown in figures 2 and 3, HSTs appear to have the highest percentage of anthropometric documentation. However, as shown in Table 2, when you consider the percentage documentation of anthropometric measures in proportion to the number of patients seen, it is the RSs who documented height and weight the most. The difference in the documentation of anthropometric measures was significant between Consultant, RSs and HSTs post hoc ANOVA testing (Bonferroni adjusted) (p<0.001).

With regards to documentation of patient's BMI or weight/height percentiles, only 5 patients (1.2%) of the total number of patients in the audit, had their BMI worked out and documented in their notes, 71 patients (16.99%) had the height and weight percentiles documented, whereas in 342 patients (81.82%), neither BMI nor percentiles were documented.

Height and weight percentiles were documented more often than BMI, and mostly documented by RSs followed by HSTs (Table 2). However, still less than 17% of the total number of patients had their percentiles documented and less than 2% had their BMI calculated and documented. On the other hand, the Consultants least documented BMI or percentiles, followed by Medical Grade Officers and General Practitioners (Figure 4).

Figure 2 Frequency of documentation of patients' height by doctor grade

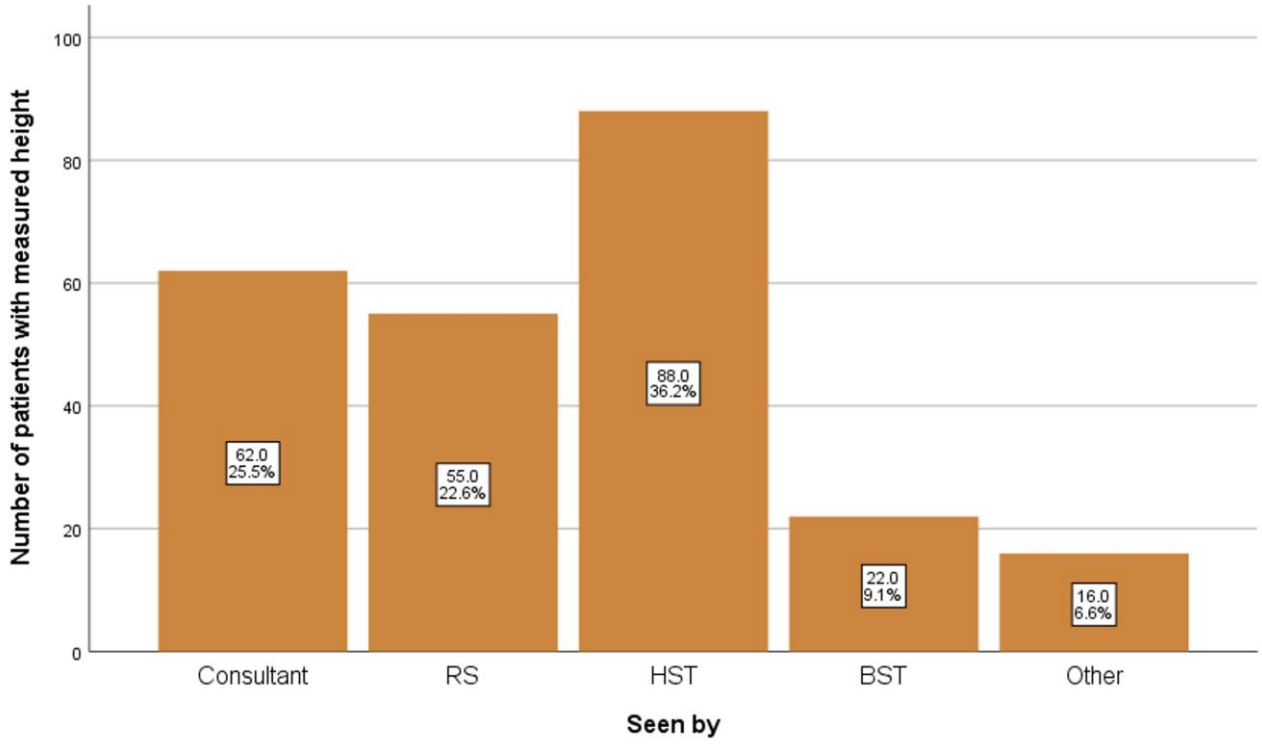


Figure 3 Frequency of documentation of patients' weight by doctor grade

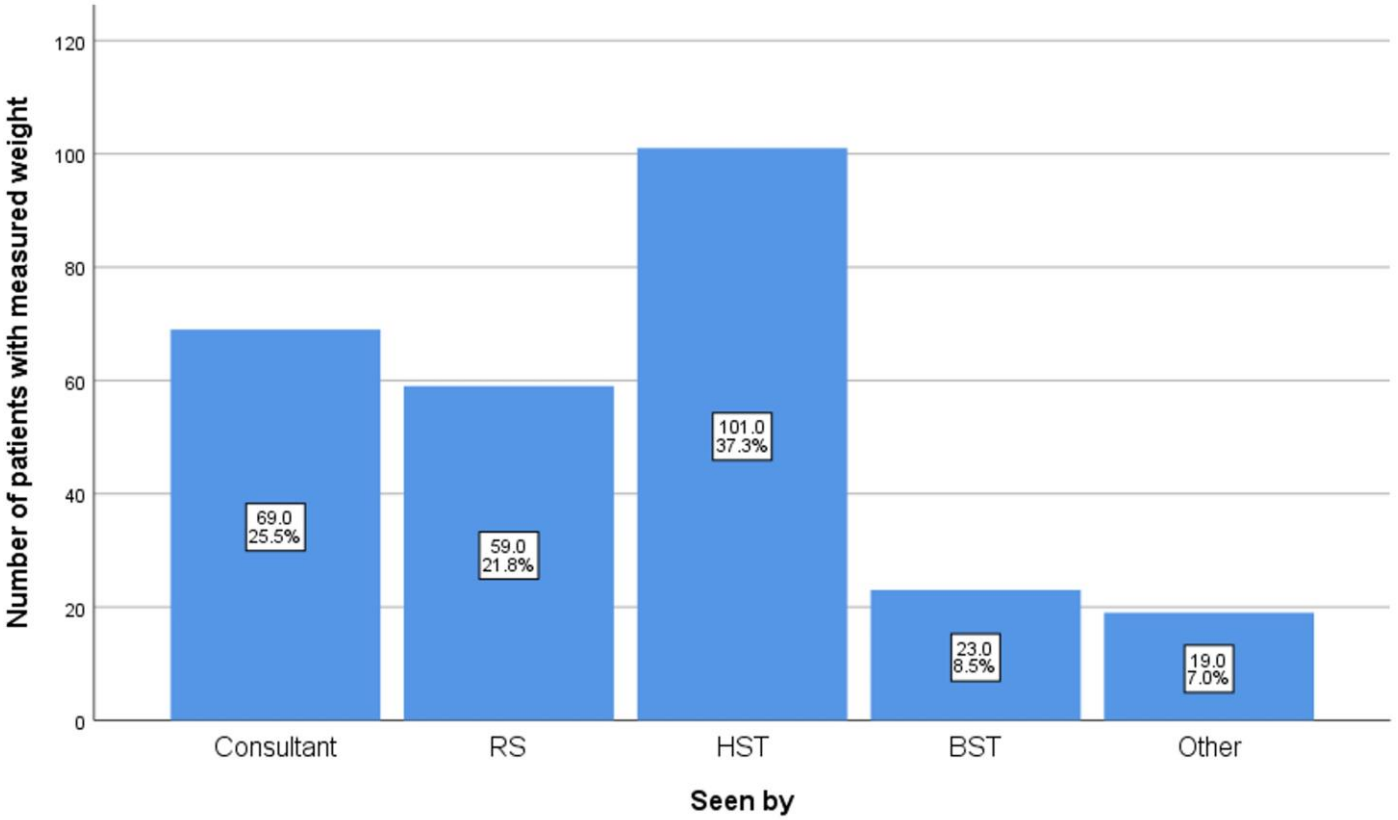
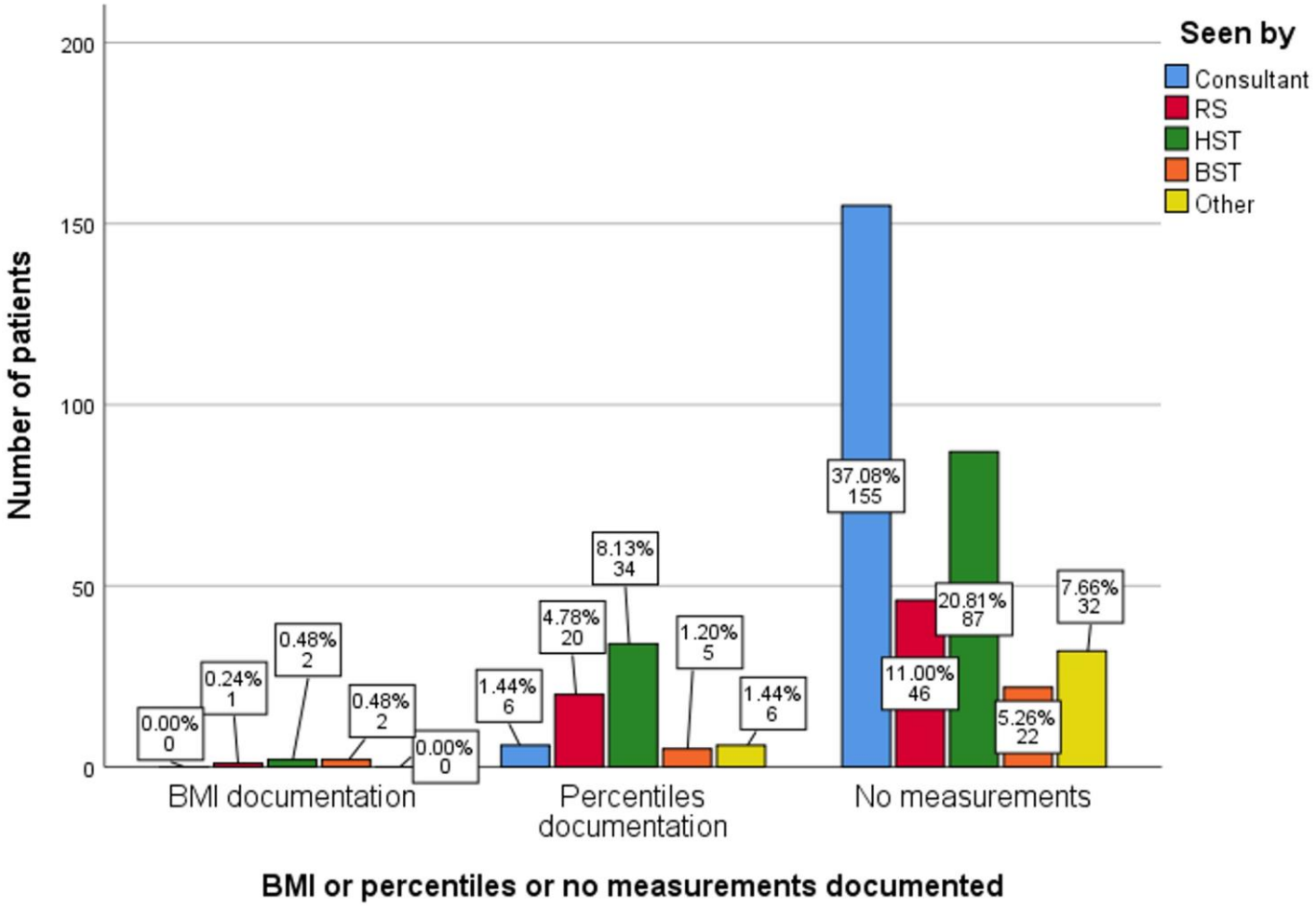


Table 2 Doctor grade and documentation of height, weight, BMI and percentiles in proportion to numbers of patients seen

Grade	Height	Weight	BMI	Percentiles
Consultant	38.5% (62/161)	42.6% (69/161)	0.0% (0/161)	3.7% (6/161)
RS	82.1% (55/67)	88.1% (59/67)	1.5% (1/67)	29.9% (20/67)
HST	71.5% (88/123)	82% (101/123)	1.6% (2/123)	27.6% (34/123)
BST	75.8% (22/29)	79.3% (23/29)	6.9% (2/29)	17.2% (5/29)
Other	42.1% (16/38)	50.0% (19/38)	0.0% (0/38)	15.8% (6/38)

Figure 4 Documentation of BMI or weight/height percentiles or no documentation according to doctor grade



BMI percentiles were calculated from the height and weight measurements documented in patients' notes (243 of 418). 42.4% of patients with documented anthropometry were overweight (13.2%, >p85) or obese (29.2%, >p95). 5.3% of patients were found to be underweight (<p2) (Figure 5).

Legend: the above was calculated when both height and weight were documented on the patients' clinical notes.

BMI z-score of 243 patients of 418, revealed slightly higher prevalence of overweight and obese children (47.4%). 27.2% patients were obese (BMI z-score >2), 20.2% were overweight (BMI z-score between 1 and 2), 41.6% had normal weight (BMI z-score between -1 and 1) and 11.1% were underweight (BMI z-score <-1) (Figures 6).

In those children in which there were no anthropometric measurements, previous episodes were perused to check whether there was any note on their height and weight. From the 175 patients with no anthropometric measurements during their last COP visit, 67 patients had a normal weight status during previous appointments, 21 patients were overweight and 31 patients were already noted to be obese but no mention on advice or updated measurements were taken during their appointment during the study period. This amounted to 29.7% of patients being either overweight or obese and not followed-

up. The other patients (32%) were either never measured, or if measured this was not documented, or their last measurements were older than 4 years.

Other investigations

Liver profiles were taken in 5 patients and were not related with obesity status (p=0.657). Blood pressure measurement was documented in 23 patients, one was noted to have a BP of p90 and another of p99 both of which were referred for 24-hr BP monitoring. Random blood glucose testing was carried out in two patients in which both were normal. HbA1c was ordered for one patient only, which was also within normal limits.

Advice

Documentation of advice given was only found in 15 patients out of 418. Only one patient was advised on diet and exercise for better weight management, the rest were only advised on a healthier diet (Figure 7).

Referrals

Out of the 114 patients who were either overweight or obese, only 2 patients were referred to the dietitian and 3 patients were referred to other clinics (ENT and paediatric nephrology).

Figure 5 Distribution of the calculated BMI percentiles

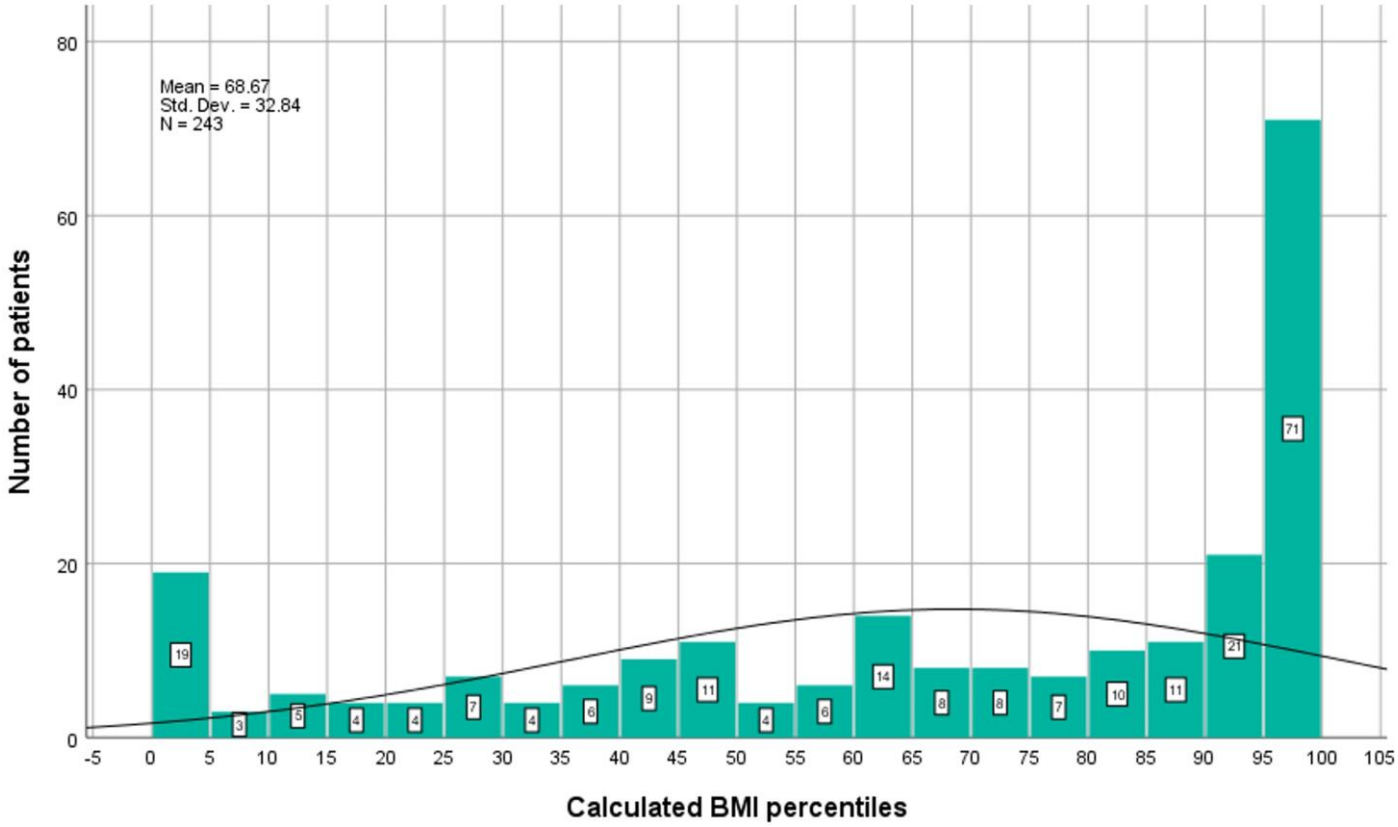
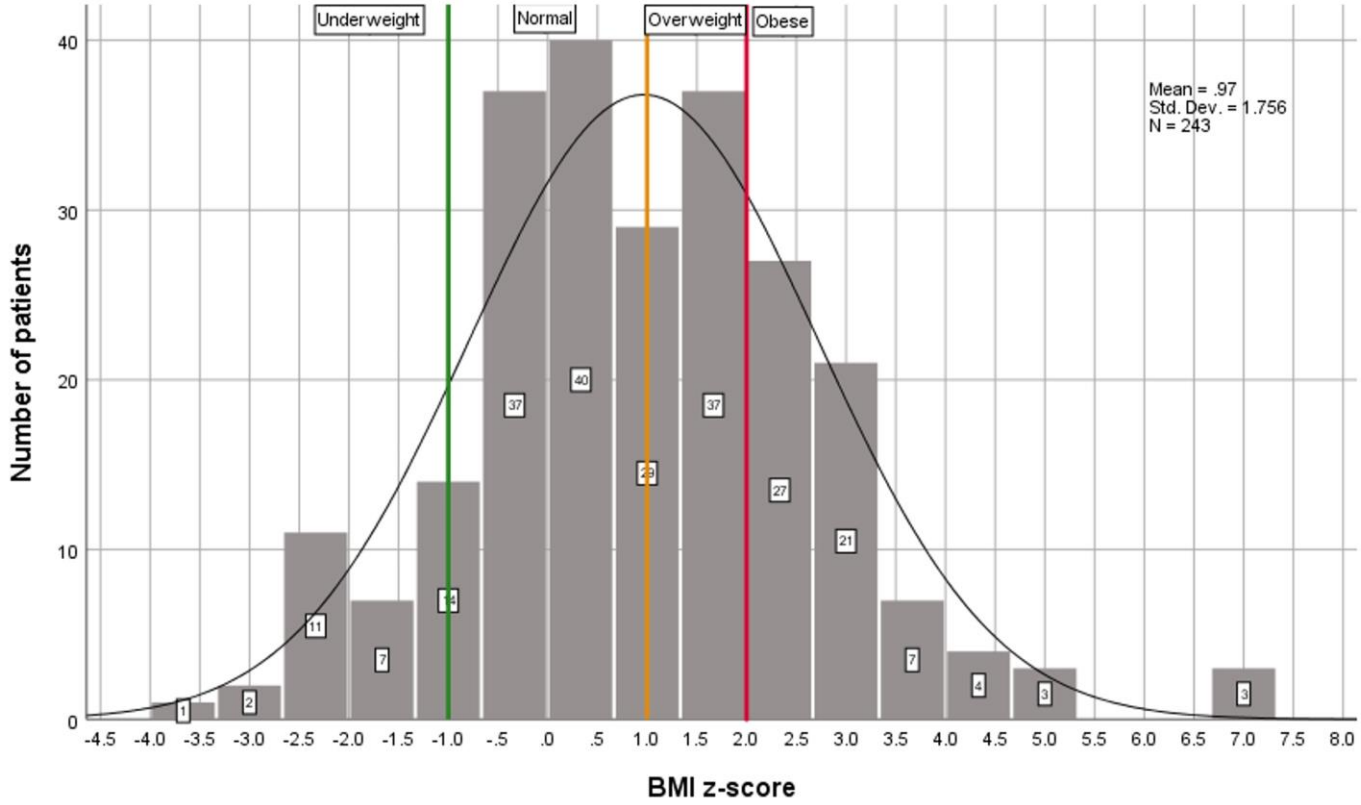
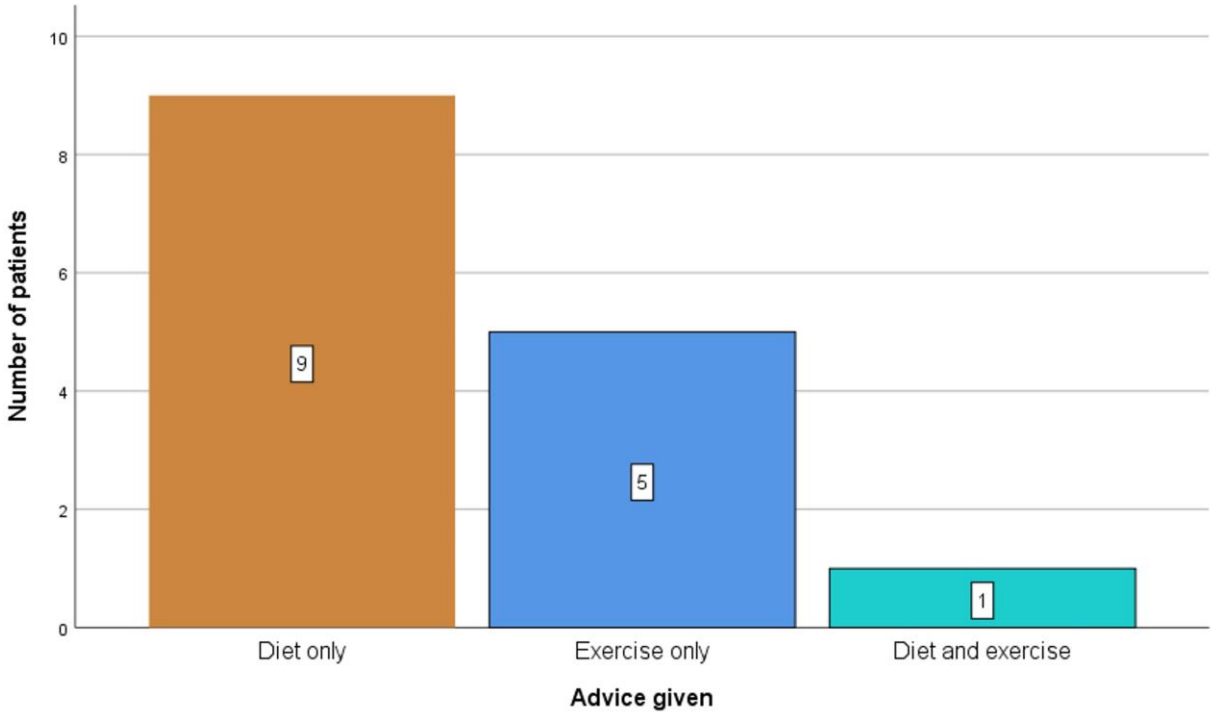


Figure 6 Distribution of the calculated BMI z-scores



Legend: Lines are depicting weight status cut-offs. Normal BMI z-scores lie between the green and orange vertical lines; Overweight BMI z-scores lie between the orange and red vertical lines and Obese BMI z-scores lie to the right of the red vertical line.

Figure 7 Documentation of advice given



DISCUSSION

The prevalence of obesity among children and adolescents has increased so rapidly over recent years that it is fast being considered an epidemic. It is an important public health problem in the developed and developing world as childhood obesity does not only lead to paediatric health issues but is also linked to premature adult mortality,[10] mental health problems,[15] social problems[16] and national economic burden.[17]

Early identification and evaluation of children with obesity should be aimed at determining the cause of weight gain and assessing for co-morbidities.[10-11] While the principal cause in most cases is an imbalance between calorific intake and physical activity, screening for potential medical and environmental factors is important.

Effective weight management programmes for children and young people can be delivered by a varied range of health care providers.[8] One venue in which weight can be evaluated in children and where additional changes may be implemented is during a children's outpatient visit. In this audit, it was noted that weight was documented in 64.8% of patients, height in 58.1%, height and weight percentiles were documented in only 17% of patients and BMI was only documented in 1.2% of a cohort of children in a typical outpatient setting. In this study, 32% of patients had never been measured at their COP visits. 60 patients with documented anthropometry had a BMI greater than the 98th centile and co-morbidity investigations were only carried out (and incompletely) in just 8 patients. These numbers are not up to standard as per current guidelines which state that all children should be screened for obesity in this setting.[8]

It was also found that 47.4% of patients whose weight and height were documented, were either overweight or obese. This prevalence is higher than that found by Grech et al in the national BMI study in 2017, in which 41.0% of children were overweight or obese.[18] One explanation for this discrepancy would be that outpatient services are more frequented by this category of patients with potentially related co-morbidities. There was a small but noteworthy discrepancy between overweight and obesity prevalence detected through BMI percentiles (42.4%) and BMI z-scores (47.4%). The major advantage of the z-score is that it permits the average and standard deviation of a group to be calculated for population-based applications. It also follows a linear scale and thus allows for summary statistics. Furthermore, it is useful for distinguishing variations at extremes of the distributions unlike percentile scores or percent of median.[19]

Furthermore, close to 30% of patients who were previously flagged up as either obese or overweight were not followed-up. The increasing prevalence of childhood obesity is associated with the emergence of typically adult-associated diseases such as type 2 diabetes, hypertension and non-alcoholic fatty disease in childhood.[11] For these reasons, weight, height and BMI should be regularly measured and documented for all out-patient visits in children.

Dietary and lifestyle advice was only documented in 7% of all children who were overweight or obese. This number could be under-reported in view of the fact that advice may have been given but not documented in the case file. This audit demonstrates poor adherence to the clinical guidance on the management of childhood obesity provided by NICE, and urgent action is required to improve

this service provision for this group of young patients.

A limitation is that this was a relatively small study on a pre-selected group of children. As the data was collected retrospectively from file documentation, anthropometric measurements may have been taken but were not documented. Although the quality of documentation in the medical setting is essential for patient continuity of care and safety, this was beyond the scope of this study. Another limitation to this study could be that possibly anthropometric measurements are likely to be taken more in paediatric patients who are perceived to be physically overweight by the assessor, therefore resulting in more overtly overweight patients being weighed, and a larger number of normal weight patients contributing to undocumented cases.

Recommendations

Suggested improvements from this audit include the use and distribution of a dietary guidelines leaflet available from the Directorate of Health Information and Research [20] for patients and their parents with additional advice on 60 minutes of daily moderate-to-vigorous physical activity (MVPA), limiting screen time to less than one hour a day, adequate sleep and healthy nutrition and beverage choice. These would accompany, but not replace, the medical consultation and serve as visual reminders to parents once the parents leave the outpatients' room. They would also ideally contain information about dietitian services should the family require further help.

Continuous medical education about childhood obesity is also essential to ensure optimization of outpatient visits. In light of the fact that only 1.75% of the patients in this audit were given a dietitian referral, it is important that adequate information is given to all paediatric staffing levels covering the different referral options and weight management programmes available.

It is important to note that this audit was carried out prior to the COVID-19 pandemic, the proportion of children being denied their physical activity has greatly escalated due to lockdowns and public concern, and therefore such studies now become more essential as the obesity rates in childhood may worsen. Innovative ideas such as online training sessions and home workouts could help mitigate this damage but require significant shift in the public mindset and new public health strategies.

A re-audit following paediatric trainee information session should also be carried out to ensure continuous assessment of appropriate local weight management screening in outpatient visits.

Currently, there is only one paediatric dietitian available at Mater Dei Hospital dealing with all nutritional issues. Hence, the waiting list to be seen when referred is long. This audit stresses the urgent need of a child obesity clinic in Malta, which could be either centralized or held in schools to reach the majority of children. Within a child obesity clinic, professional help may be provided with multi-disciplinary input, for effective management programmes of childhood obesity, including the use of FDA-approved pharmacotherapy and bariatric surgery. Only this will help prevent children with obesity to grow into obese adults with all the social, physical, mental and economic implications associated with it.

SUMMARY BOX

What is already known:

- Childhood obesity is a worldwide epidemic particularly in Malta.
- Opportunistic screening for overweight and obesity should be carried out routinely by doctors assessing children so that early identification and evaluation of children with obesity should be aimed at determining the cause of weight gain and assessing for co-morbidities.
- The NICE guideline on Obesity: identification, assessment and management (CG189), is freely available to guide gold-standard management of obesity in children.

New findings from this study

- Doctors' documentation of overweight and obesity is lacking.
- Children with overweight or obesity are not always flagged up, most are not investigated further for obesity co-morbidities and are not provided with adequate skills in order to manage their weight status (no leaflets, no dietitian referrals).
- Continuous medical education for doctors in the management of childhood obesity is required, together with the available referral options and weight management programmes available.
- This audit stresses the need of a dedicated obesity clinic in Malta.

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