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Invited Review

Overweight/obesity and chronic health conditions in older people with intellectual disability in Ireland

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Abstract

Background This study examines overweight/obesity and chronic health conditions (CHCs) in older people with intellectual disability (ID).
Methods Data for this cross-sectional observational study emanated from Wave 2 of the Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing, a longitudinal study assessing the health and well-being of older Irish adults with ID aged ≥40 years across all levels of ID. Participation involves an interview process and collation of objective health measures. In this study, body mass index (BMI) (n = 572), used as a measure of weight status, was examined with clustered doctor's diagnosed CHCs. Descriptive analysis was conducted where counts (n) and proportions (%) were used to summarise the variables univariately, while cross-tabulations were used for bivariate summary into counts and proportions. With overweight/obesity prevalence established and patterns described using logistical regression, Pearson's chi-squared test was used to test for significant associations.
Results Overweight/obesity identified in 69% of participants occurred with greater frequency in women (72%). A higher percentage of participants aged <50 years (72.5%) were overweight/obese than those aged 50–64 (70%) and 65+ (61.4%). Level of ID and residence type were significantly associated with weight status ($P < 0.001$), with overweight/obesity more prevalent in mild (85.7%) than moderate (72%) or severe/profound ID (51.4%). Of those who lived independently/with family, 78.4% were overweight/obese, as were 74% living in a community group home ($P < 0.001$). Almost all overweight/obese participants' waist measurements were in the substantially increased risk of metabolic disease waist measurement category (92%, $P < 0.001$). Logistical regression used to model CHCs on BMI showed significant association between BMI and gastrointestinal tract [odds ratio (OR) = 0.57, $P < 0.008$, 95% confidence interval (CI) = (0.37; 0.86)], respiratory condition [OR = 8.95, $P < 0.004$, 95% CI = (2.57; 56.72)] and musculoskeletal disorders [OR = 0.40, $P < 0.001$, 95% CI = (0.25; 0.63)].

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Conclusions The findings illustrate the strong cross-sectional association between overweight/obesity and CHCs. These findings suggest a need to prioritise weight status as a health risk to people with ID as they age.

Keywords body mass index, chronic health conditions, intellectual disability, obesity, overweight

Introduction

Overweight/obesity in adulthood is a global phenomenon [World Health Organization (WHO) 2015]. International narratives indicate that 1.9 billion adults are overweight with over 650 million obese (WHO 2018). A greater proportion of the world's populace now reside in countries where mortality relative to obesity outweighs -mortality caused by undernutrition (WHO 2021). Obesity is a disease process, where body fat exceeds the recommended measurable norms negatively affecting health (National Institute for Health and Care Excellence 2014; Bray *et al.* 2017). As a life-limiting but modifiable condition, overweight/obesity is also associated with secondary disability, increased health burden and further disability as people age (Ellis *et al.* 2006; Dee *et al.* 2014). It contributes to chronic health conditions (CHCs) such as hypertension, diabetes, heart disease, osteoporosis and depression (Phillips *et al.* 2014; Sari *et al.* 2016) and some cancers (Ogunbode *et al.* 2009; Patterson *et al.* 2013). Furthermore, it is a predominant risk factor for metabolic syndrome where increased waist circumference features (Adult Treatment Panel III 2001; Carroll *et al.* 2014; Gaston *et al.* 2019).

The pervasive nature and dynamics of overweight/obesity threaten the health and well-being of people with intellectual disability (ID) (Mencap 2004; Willis 2007; Bowness 2014). Down syndrome (Melville *et al.* 2005), low activity levels (Emmerson 2005; Grundi 2006; Burke *et al.* 2014) and environmental influences (Hsieh *et al.* 2014) contribute to increased risk exposure. In the context of advancing age in ID, the prospect of developing age-related health conditions is recognised (Petrenko *et al.* 2014) and augmented when coexisting with overweight/obesity.

Overweight/obesity is prevalent among people with ID (Bradley 2005; de Winter *et al.* 2012; Neumeier *et al.* 2017). Burke *et al.* (2017) in a longitudinal study on ageing and ID, using objective measures, reported 79.7% of older adults to be overweight or obese. A further Irish study by McGuire *et al.* (2007) reported 68% of people with ID to be overweight/obese. Foley *et al.* (2017) examined body mass index (BMI) and waist circumference records from 4174 (2683 men and 1491 women) Latin American Special Olympic athletes demonstrating a significant difference in prevalence, with overweight/obesity (BMI ≥ 25) appreciably higher in women than men (49% vs. 40.8%) and waist circumference measures (≥90 cm in men and ≥94 cm in women) indicating 24.4% prevalence for women and 19.6% in men. Kinnear *et al.* (2018) examined the prevalence of multi-morbidity in people with ID involving over 1000 participants aged 16 years and older and cited obesity as the second most prevalent of 20 dominant conditions (40.6%) but the most dominant condition for people with Down syndrome (56.5%). These prevalence rates are similar to general population trends. A longitudinal study on ageing involving older Irish adults reported 79% occurrence for overweight/obesity (Leahy *et al.* 2014). Kearns *et al.* (2014) examined data on over 10 000 Irish adults describing higher prevalence rates for both overweight and obesity in men (43.0% and 16.1%) than women (29.2% and 13.4%) and chronic disease burden increasing with subsequent increases in BMI.

Despite available research describing overweight/obesity in adults with ID, little research addressing weight status and CHCs exists. Flygare Wallén *et al.* (2018), in a comparative analysis of data over a 17-year period on the prevalence of diabetes, hypertension and obesity in people with ID, autism spectrum disorder and Down syndrome compared with general population data, reported more than double the risk for both obesity and diabetes in those with ID or autism spectrum disorder. Haveman *et al.* (2010) studied the health risk experienced by people with ID as they age. This examination described obesity not only as a risk to positive ageing but also as a contributory factor for other health-related conditions. Further research by Rimmer *et al.* (2010) and Yamaki *et al.* (2011) considered health conditions associated with obesity in adolescents. Although these studies focused on

adolescents with ID, in both studies, obese participants had higher levels of CHCs including hypertension and diabetes.

With limited available evidence describing overweight/obesity (Folch *et al.* 2019) and CHCs in older people with ID, the purpose of this study was to determine if older adults with ID in Ireland who are overweight/obese experience CHCs.

Data collection

Data from Wave 2 of the Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing informed this study. This national representative longitudinal study examines the health and well-being of older adults with ID ≥ 40 years with ages ranging from 41 to 90 years, across all levels of ID, living in a variety of accommodation from independent or with family, to community group home or residential facility (McCarron *et al.* 2011; Burke *et al.* 2014; McCarron *et al.* 2017). Data on age range were, for the purpose of analysis, categorised into three groupings with 40 years the commencement age to account for the early onset of conditions such as dementia. Subsequent age groupings (50–64) were determined by the global body of longitudinal studies to enable convenient comparison.

Participants were randomly recruited from the National Intellectual Disability Database, a database composing of people with ID who access services in Ireland (Kelly *et al.* 2011). Ethical approval for each wave of data collection was obtained from the Faculty of Health Sciences, Trinity College Dublin, and by all participating service providers involved in the study (N = 138). Data collection involved two instruments, a pre-interview questionnaire (PIQ) and computer-assisted programme for interview. Participants received the PIQ, an information letter and accessible information booklet a minimum of 1 week prior to the face-to-face interview, affording time to source and review relevant information. On the day of the interview, the trained field worker collected, verified and checked information in the PIQ.

Measurement

In Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing Wave 2, a full suite of objective health measures were gathered during a health fair by a trained nurse (Fig. 1), including anthropometric measures of height, weight and waist circumference (Burke *et al.* 2020).

In total, 572 participants had their BMI calculated based on objective measures, with BMI as body weight in kilograms divided by height in metres squared (Rolland-Cachera *et al.* 2015). The WHO cut-offs for BMI were adopted: underweight BMI ≤ 18.50 kg/m^2; normal weight ≥18.50–24.99 kg/m^2; overweight ≥25.00–29.99 kg/m^2;

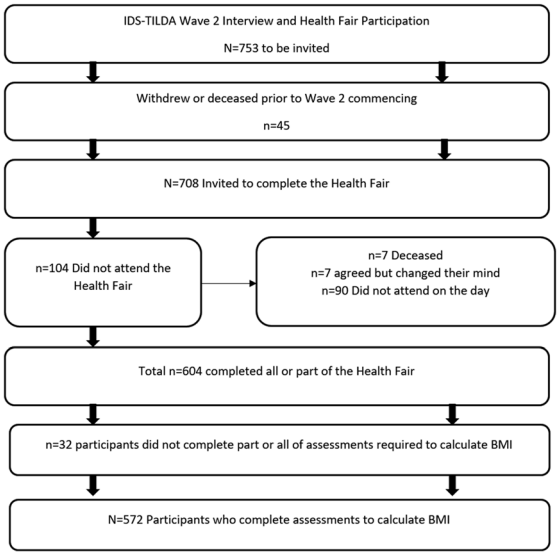

FIGURE 1. Health fair attendance flow chart. BMI, body mass index; IDS-TILDA, Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing.

and obese ≥ 30 kg/m² (WHO 1995). Ulna length (measuring length between olecranon process and the styloid process) as a surrogate height measure was used for participants who were unable to have their height measured (n = 155). Additionally, mid-upper arm circumference (n = 79) was used as an alternative for participants with mobility issues (BAPEN 2012; Nowak-Szczepanska *et al.* 2019; Das *et al.* 2020). Involving measures of the left upper arm circumference at the midpoint between the olecranon and acromion process', a mid-upper arm circumference <23.5 cm indicated a BMI less than 20 kg/m² (underweight) and >32.0 cm a BMI greater than 30 kg/m² (obese). Therefore, for the purpose of analysis in this study, overweight and obesity were analysed as a single category. With BMI considered the predictor variable and CHCs the response variable, data were stratified by gender, age, level of ID, living circumstances and waist circumference.

Chronic health conditions (Table 1) were clustered into broad disease categories, cardiovascular disease (CVD), metabolic disease, gastrointestinal tract (GIT), respiratory disease, neurological disease, musculoskeletal disorders and mental health. With consideration to missing data, only valid percentages are presented throughout this paper.

Data analysis

RStudio version 1.2.5033 was used to conduct analysis. Pearson's chi-squared test was used to determine whether significant bivariate associations (P-value <0.05) existed between being overweight/obese, the demographic characteristics and the various CHCs. Alpha was set at 0.05 [95% confidence interval (CI)]. All classes had expected frequencies sufficiently large enough not to use Fisher's exact test. Because all the CHCs were binary targets, logistic regression was used to model CHCs on BMI while controlling for demographic differences. Logistic regressions were assessed based on the P-value of a likelihood ratio test (0.05 level of significance) and Nagelkerke's R^2. For each CHC, the reference category was 'not having the CHC'. Predictors were assessed for significance based on their associated Wald test P-values (0.05 level of significance). Odds ratios and associated 95% CIs were also included. Waist classification was not included in the model because of a strong association with BMI. Across the dataset, only 8% of cases had missing data (Table 2) and therefore were excluded from the analyses. As the numbers for underweight were low (3.2%, n = 20), these were considered within a single combined BMI category underweight and normal.

Results

As indicated in participants' profile (Table 3), the majority of the 572 participants were female (57.8%), with 28% aged <50 years, 51.5% aged 50–64 years and a further 20% aged 65 years and older. The most frequently reported level of ID was moderate (48.8%), severe/profound (27%) followed by mild ID (23.6%). More people lived in a community group home (44%) than in residential care (40%) or independent/with family (15.4%).

Table 1 Chronic health conditions

Condition descriptive	Cluster of conditions (variables used for analysis purposes)
Cardiovascular disease (CVD)	High cholesterol, heart murmur, abnormal heart rhythm, high blood pressure, angina, heart attack, congestive heart failure, stroke, mini-stroke, TIA, varicose ulcer
Metabolic disease	Diabetes, hyperthyroid and hypothyroid disease
Gastrointestinal tract (GIT)	Coeliac, stomach ulcers, PKU, gastroesophageal reflux, constipation
Respiratory disease	Asthma, lung disease
Neurological disease	Cerebral palsy, Alzheimer's disease, dementia, epilepsy, Parkinson's disease, multiple sclerosis, muscular dystrophy
Musculoskeletal disorders	Osteoporosis, arthritis, scoliosis
Mental health	Emotional, nervous or psychiatric disorder

PKU, phenylketonuria; TIA, transient ischaemic attack.

Table 2 Missing values of independent variables

Variable	Category	*N* 572	Missing Count	%
Gender	Male, female	572	0	0
Age	<50, 50–64, 65+	565	7	1
ID level	Mild, moderate, severe/profound	532	40	7
Residence type	Independent/family, community group home, residential care	570	2	0.3

ID, intellectual disability.

Table 3 Profile of study participants

	Frequency	%	Total (*n*)
Gender			572
Male	241	42.13	
Female	331	57.87	
Age			565
40–50	160	28.32	
50–64	291	51.50	
≥65	114	20.18	
Level of ID			532
Mild ID	126	23.68	
Moderate ID	260	48.87	
Severe/profound ID	146	27.44	
Residence type			570
Independent/with family	88	15.44	
Community group home	253	44.39	
Residential centre	229	40.18	

ID, intellectual disability.

As indicated in Table 4, of the total number of participants (n = 572), over two-thirds (69%) were overweight/obese compared with the normal weight range (31%). Women were more overweight/obese than men 72% (n = 239) vs. 64.7% (n = 156), respectively. All age categories presented with high levels of overweight/obesity with the highest prevalence in those <50 years (72.5%) followed by the 50- to 64-year-old cohort (70%) and 65+ (61.4%).

Individual association tests revealed that level of ID, residence type, waist classification and CHCs GIT, respiratory and musculoskeletal disorders were significantly related to normal BMI or overweight/obese (Table 4). Participants with a mild (85.7%, n = 108) or moderate (72%, n = 188) ID were more likely to be overweight/obese than those with severe/profound ID (51.4%, n = 75) ($P < 0.001$). The majority who were overweight/obesity lived independently/with family (78.4%, n = 69) or in a community group home (74%, n = 188) ($P < 0.001$). Furthermore, waist circumference measures (n = 499) indicated increased risk for risk of metabolic complications (WHO 2008) for 51.8% (n = 44) with almost all overweight/obese participants having a waist measurement that exposed them to substantially increased risk of metabolic disease (91.6%, n = 304) ($P < 0.001$). In terms of CHCs, there were significant associations with GIT ($P < 0.001$), respiratory disease ($P < 0.011$) and musculoskeletal disorders ($P < 0.001$). Over half who had GIT were overweight/obese (59%, n = 148). Although the overall number with respiratory disease was low (n = 37), 89% who had the disease were overweight/obese, as were 57% (n = 80) of those with musculoskeletal disorders. Interestingly, CVD, an acknowledged risk factor associated with excess weight, was not found to be significant in this study populace (71%, n = 201) ($P < 0.0.359$).

A logistic regression model (Table 5) for CHCs on BMI (normal weight and overweight/obese) adjusting for demographic differences indicated a significant association with GIT disorder [odds ratio (OR) = 0.56, P-value = 0.008, 95% CI = (0.37; 0.86)], although the likelihood was greater for those within the normal weight range (OR 1.75). BMI was also significantly associated with respiratory condition [OR = 8.95, P-value = 0.003, 95% CI = (2.56; 56.72)] with the risk associated with overweight/obesity 8.95 times greater than in the normal/underweight range. Lastly, having musculoskeletal condition posed risk [OR = 0.39, P-value <0.0001, 95% CI = (0.24; 0.63)], although the likelihood was greater for those in the normal weight category (OR 2.50).

Table 4 BMI stratified by demographics and CHCs

Characteristic	Normal BMI	%	Overweight/obese (BMI)	%	*P*-value	Total *n* = 572
Demographics						
Gender					0.069	572
Male	85	35.3	156	64.7		
Female	92	27.8	239	72.2		
Age†					0.125	565
<50	44	27.5	116	72.5		
50–64	87	29.9	204	70.1		
65+	44	38.6	70	61.4		
ID level†					**<0.001**	532
Mild	18	14.3	108	85.7		
Moderate	72	27.7	188	72.3		
Severe/profound	71	48.6	75	51.4		
Residence type†					**<0.001**	570
Independent/family	19	21.6	69	78.4		
Community group home	65	25.7	188	74.3		
Residential care	92	40.2	137	59.8		
Waist classification†					**<0.001**	499
Normal	69	84.1	13	15.9		
Increased risk	41	48.2	44	51.8		
Substantially increased risk	28	8.4	304	91.6		
CHCs						
CVD					0.359	572
	82	29.0	201	71.0		
Metabolic					0.74	572
	41	32.5	85	67.5		
GIT					**<0.001**	572
	102	40.8	148	59.2		
Respiratory					**0.011**	572
	4	10.8	33	89.2		
Neurological					0.073	572
	76	35.7	137	64.3		
Musculoskeletal disorders					**<0.001**	572
	61	43.3	80	56.7		
Mental health					0.205	572
	81	28.3	205	71.7		

Alpha set at 0.05. All significant factors are in bold.

†Denotes missing values – participants did not answer to all the questions asked.

BMI, body mass index; CHCs, chronic health conditions; CVD, cardiovascular disease; GIT, gastrointestinal tract; ID, intellectual disability.

Discussion

Obesity's contribution to chronic ill health among people with ID is not fully established. This study reports novel information on the association between overweight/obesity (BMI) and doctor's diagnosed CHCs, in older people with ID. Most participants with measured BMI were overweight/obese (69%), which was more prevalent in women (72%). Over 60% of participants in each age category were overweight/obese, with the highest prevalence in those aged <50 years (72.5%). These findings are similar to other studies involving people with ID (Bhaumik *et al.* 2008; Stancliffe *et al.* 2011; Hsieh *et al.* 2014) but differ to some general population studies. A longitudinal study on ageing in Ireland (TILDA) reported higher levels of obesity in men than women, although the variance was low (38% vs. 33%) (Leahy *et al.* 2014). A further Irish study using self-reported weight status described fewer women than men as overweight (33% vs. 45%); however, the inverse was true for obesity (26% vs. 24%) (Morgan *et al.* 2008).

Table 5 Most frequently reported CHCs significantly related to overweight/obesity (BMI)

Characteristic	Coef.	SE	Wald	*Pr*(|*Z*|) *P*-value	OR
GIT					
Gender female	0.175	0.196	0.89	0.37098	1.1918
Age 50–64	−0.229	0.227	−1.01	0.31157	0.7948
Age 65+	0.231	0.281	0.82	0.41250	1.2592
ID 2 (moderate)	0.473	0.257	1.84	0.06574	1.6048
ID 3 (severe/profound)	1.265	0.299	4.24	0.00002***	3.5428
Community group home	1.239	0.366	3.39	0.00071***	3.4521
Residential care	1.565	0.375	4.17	0.00003***	4.7829
BMI: overweight/obese	−0.566	0.214	−2.65	0.00807**	0.5680
Respiratory					
Gender female	0.1405	0.3823	0.37	0.7133	1.1507
Age 50–64	0.2365	0.4478	0.53	0.5974	1.2668
Age 65+	0.2724	0.5519	0.49	0.6216	1.3131
ID 2 (moderate)	−0.5857	0.4474	−1.31	0.1905	0.5567
ID 3 (severe/profound)	−0.0874	0.5103	−0.17	0.8640	0.9162
Community group home	0.0840	0.6096	0.14	0.8904	1.0876
Residential care	0.7884	0.6150	1.28	0.1998	2.1999
BMI: overweight/obese	2.1918	0.7501	2.92	0.0035**	8.9516
Musculoskeletal disorders					
Gender female	1.1684	0.2427	4.81	0.000001***	3.2167
Age 50–64	0.6099	0.2849	2.14	0.03230*	1.8402
Age 65+	1.2793	0.3243	3.94	0.00007***	3.5941
ID 2 (moderate)	−0.0692	0.2782	−0.25	0.80366	0.9332
ID 3 (severe/profound)	−0.3538	0.3404	−1.04	0.29873	0.7020
Community group home	0.5081	0.3738	1.36	0.17414	1.6621
Residential care	0.4893	0.3902	1.25	0.20976	1.6312
BMI: overweight/obese	−0.9245	0.2399	−3.85	0.00012***	0.3967
Mental health					
Gender female	0.0641	0.1886	0.34	0.734	1.0662
Age 50–64	0.1692	0.2175	0.78	0.437	1.1843
Age 65+	0.4428	0.2756	1.61	0.108	1.5571
ID 2 (moderate)	−0.4677	0.2450	−1.91	0.056	0.6264
ID 3 (severe/profound)	−0.0901	0.2895	−0.31	0.756	0.9139
Community group home	1.3696	0.3239	4.23	0.00002***	3.9338
Residential care	1.9588	0.3428	5.71	0.000001***	7.0910
BMI: overweight/obese	0.3848	0.2104	1.83	0.067	1.4693

Alpha set at 0.05.
*$P < 0.05$.
**$P < 0.01$.
***$P < 0.001$.
BMI, body mass index; Coef, correlation coefficient; GIT, gastrointestinal tract; ID, intellectual disability; OR, odds ratio; SE, standard error.

In contrast, systematic examination of prevalence rates for obesity across Europe signifies slightly higher overall frequency for women (Berghöfer *et al.* 2008). Considering the risk excess weight poses to women's health, coupled with their age profile in this study situated across menopause, the potential risk to health is noteworthy (Davis *et al.* 2012).

Identified links between living arrangements and weight status are of interest. Living independently/with family (78%) or in a community group home (74%) were the most frequently cited living arrangement related to excess weight. Moreover, the level of ID was significantly associated with a BMI ≥ 25, with mild or moderate ID posing

the most risk (85.7% and 72%). Policy changes in service supports, coupled with increased personal decision-making autonomy (Department of Health 2005; Government of Ireland 2015), may contribute to this finding. Factors including personal awareness, limited individual, carer or family understanding of positive nutrition (Cartwright *et al.* 2015; Hamzaid *et al.* 2018) or associated health risks (Bowers *et al.* 2014) influence decision-making. Further challenges equating feelings of hunger and satiety to food consumption may also act as contributory factors (Rubbert 2012) signifying support to maintain a healthy lifestyle (Lorentzen & Wikström 2012).

Associational findings between BMI ≥ 25 and gastrointestinal disorders are illustrated in studies where stomach ulcers, phenylketonuria, gastroesophageal reflux and constipation are problematic in ID (Bohmer *et al.* 2000; Galli-Carminati *et al.* 2006), as is coeliac disease, now more frequently described in obesity (Valletta *et al.* 2010), a particular risk for people with Down syndrome (Harper 2018). Over half of all participants in this study with a BMI ≥ 25 had a GIT disorder (59%), but this was not a significant feature in the regression models. Nonetheless, the limited available evidence examining correlations between GIT and obesity in ID with general population studies indicate divergent findings (Emerenziani *et al.* 2020). Ringhofer *et al.* (2017) reported significant association between overweight/obesity and gastroesophageal reflux disease when using waist-to-hip ratio as a measure. Talley *et al.* (2004) and Eslick (2012) reported associations between BMI and GIT symptoms including heartburn, gastroesophageal reflux, abdominal pain (upper), increased stool frequency and incomplete bowel evacuation, although significant associations with symptoms such as constipation, problematic in ID, were not found. This issue requires further examination in the context of ID, including alternative measures for GIT disorder with consideration given to diagnostic overshadowing often acknowledged as problematic in ID (Merrick & Merrick 2007; Javaid *et al.* 2019).

Findings linked to respiratory disease warrant attention. A condition recognised by the World Health Organisation as a predominant risk factor contributing to mortality (WHO 2014) and a leading cause of death in ID (Trollor *et al.* 2017; National Health Service 2019). Participants of this study who were overweight/obese were almost nine times more likely to have respiratory illness than those within the normal weight range (OR = 8.95). Although the overall number reporting respiratory illness in this study was low ($n = 37$), almost all who had respiratory disease were overweight/obese (89%). Compromising the mechanism of breathing, obesity imposes both physiological and biological alternations in lung capacity (Parameswaran *et al.* 2006). Obesity can substantially affect respiratory effectiveness, interfering with respiratory system compliance and increasing the individuals to higher risk of developing further respiratory conditions (Dixon & Peters 2018).

Age progression leads to physiological and age-related changes to the body (Department of Health 2013). Although musculoskeletal disorders were prevalent in the overweight/obese population (57%), in the regression analyses, the association was not significant and is another finding deserving of further investigation. Available data suggest that limited activity intensifies conditions such as sarcopenia (Karlsson *et al.* 2020) with frailty compromising the body's reserves increasing exposure to fragility and fractures (Burke *et al.* 2019). Furthermore, inadequate activity levels widely reported among people with ID (Grundi 2006; Burke *et al.* 2014; Lynch *et al.* 2021) have been identified as exposing older people with ID to poorer health outcomes and increased disease presentation as they age (García-Domínguez *et al.* 2020). Yet the significance of these physiological changes was not supported in analyses here.

Mental health also arose in this study for 72% of participants who were overweight/obese, although the association was not significant. This finding correlates with other literature indicating that people who experience mental ill health are often also overweight/obese [Cohn 2010; Preiss *et al.* 2013; National Collaborating Centre for Mental Health (UK) 2014; Avila *et al.* 2015].

Cardiovascular disease risk factors vary across countries and communities (Chow *et al.* 2009) with excess weight an acknowledged risk factor. However, what is of interest in this study was the associated risk between CVD and BMI, which was neither indicated nor significant when examined across the model ($P < 0.0854$). It is unclear why this may be the case when risks are apparent and overall high prevalence

rate for CVD (71%). Interestingly, IDS-TILDA reported low rates of hypertension (17.5%) despite 69% being overweight/obese and activity levels low with almost 70% not meeting normal daily activity levels. Nevertheless, other risk factors such as smoking and alcohol consumption were low, which may be a contributing factor to reducing overall risk (Burke *et al.* 2014). However, the possibility of underreporting in ID is noted (Jansen *et al.* 2013), coupled with the absence of objective medical tests, which may imply hidden disease. Nonetheless, further investigation to establish greater understanding of absent associated risks is evidentially warranted.

Although evidence citing the prevalence of overweight/obesity in ID exists, this nationally representative study uniquely contributes to understanding overweight/obesity and the health of an older population of people with ID. The burden excess weight poses on health and well-being across the life course, from early pregnancy (Hinkle *et al.* 2012) to advanced age in ID, highlights the need for early intervention within primary care.

This study presents distinct information relating to women with an ID and is, to our knowledge the first study presenting data on the health conditions experienced by women with ID who are overweight/obese at menopause. Providing such discourse appraises health and social care professionals of the need to effect change and is a basis for focused education and research. Targeted health and well-being guidance available for parents at preschool level, when problematic eating habits and food taste are developing, is required. School and community programmes including nutritional health and well-being, with cookery classes ensuring reasonable adjustment, should be readily available to people with ID. Moreover, considering participants living arrangements, mandating health and well-being education programmes for support workers with regulators monitoring service support against contributing metrics should be regularised. Enabling people with ID to lead this change through enhanced policy development is ostensible.

Policy targets recommend daily activity levels (Department of Health 2016). However, active lifestyles require enabling physical environments, surfaced off road walkways, public lighting and accessible public toilet facilities to sustain meaningful engagement by people with ID. Understanding the lived experience as a prerequisite to inclusive ambitious policy targets is apparent as is cross-departmental government work practice addressing lifestyle factors, including health, housing, transport and food safety. Open access to active community groups and sports organisations, with reasonable adjustments made for people with ID, should be contingent on the provision of government funding supports with longitudinal data collation providing an evidence base effecting change.

Although this research provides a scientific foundation in understand overweight/obesity and CHCs, there are limitations when interpreting the results. Deeper analysis across causes of ID, risk factors and complexity of the chronic disease would inform emergent risks across groups. BMI is not an optimal measure of body fat but a globally accepted instrument for weight categories recommended by the WHO (1995). Lifestyle influences, psychosocial dynamics, and biological and environment factors all exert influence on weight status and consequently health outcomes (Sharma & Kushner 2009; NCD Risk Factor Collaboration 2017) and should not be inferred from these findings, as they were not the focus of this paper. Reporting respiratory disease as a single category is somewhat restrictive compared with previous studies (Murugan & Sharma 2008; Zammit *et al.* 2010), but significant considering evidence linking mortality to respiratory disease (Blair *et al.* 2019) and obstructive sleep apnoea, principally associated with Down syndrome (Simpson *et al.* 2018).

This study highlights concerning adverse health effects associated with overweight/obesity in older people with ID including GIT, respiratory disease and musculoskeletal disorders. The inclusion of level of ID and living arrangements exposed the risk to women, in particular women with a moderate ID, living within community settings who are experiencing menopause. This study highlights the importance of longitudinal data collection on weight status, health and older people with ID.

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Data availability statement

Due to the nature and small population from which this sample was drawn the participants could possibly be identifiable. All data are held within an encrypted secured drive only accessed by assigned personnel. Those wishing to access may do so with the permission of the PI. All interested researchers may apply to the study.

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Conflict of Interest

This paper has been conducted in accordance with ethical principles and standards including the Declaration of Helsinki. I can confirm that this manuscript has not been published elsewhere and is not under consideration by another journal. All authors have approved the manuscript and agree with its submission to the *Journal of Intellectual Disability Research*.

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