

Neurodivergence, learning disability and metabolic syndrome conditions, in England

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Background

- A higher prevalence of metabolic syndrome conditions amongst individuals with learning disabilities is well established; however, there is mixed evidence for neurodivergent adults.
- Metabolic syndrome refers to a group of health disorders, including insulin resistance, abdominal obesity, and hypertension (Anagnostis, 2022).
- Metabolic syndrome is a significant public health issue in the UK, with approximately 1 in 3 adults having hypertension and 4.9 million having diabetes (Blood Pressure UK, 2021; Diabetes UK, 2019). Almost 33% of adults are overweight, 28% are obese (Baker, 2022).
- In the UK, two weight loss management programmes, 'Weightwise' and '12-month challenge workbook', are available to individuals with learning disabilities. In addition annual health checks are available from age 14 years.
- Neurodivergent conditions are not classified as learning *disabilities* in England (PHE, 2020; PHE 2023). Neurodivergence in England is categorised as a learning *difficulty* as it is perceived as not affecting intellectual abilities.

Methods

- Health Survey for England data 2016-2019 were analysed. N= 32,390
- 728 with neurodivergent conditions and 1419 with learning disabilities.
- Diabetes was self-reported, physician-diagnosed.
- Hypertension was assessed through blood pressure readings or reported medication use.
- Obesity and overweight were measured objectively.
- Covariates included age, sex and ethnicity, and physical activity (2017-2018 subsample).

Results

Diabetes

Diabetes	Year 2016-2019 (Adjusted for Age, Sex and Ethnicity)				Year 2017 - 2018 (Additionally, Adjusted for Physical Activity)			
	Sample Size	OR	p-Value	95%CI	OR	p-Value	95%CI	
Neurodivergence	N=32,278				N=13,692			
No reported neurodivergence		1			1			
Neurodivergence		4.18	<0.001	3.82 4.57	3.57	<0.001	3.06 4.17	
Learning Disability	N=32,281				N=13,694			
No reported learning disability		1			1			
Learning disability		2.39	<0.001	2.01 2.85	1.50	0.016	1.08 2.08	

Overweight

	Sample Size	Year 2016-2019 (Adjusted for Age, Sex and Ethnicity)			Year 2017-2018 (Additionally Adjusted for Physical Activity)		
		RRR	p-Value	95%CI	RRR	p-Value	95%CI
Overweight							
Neurodivergence	N=26,389					N= 11,824	
No reported neurodivergence		1				1	
Neurodivergence		1.12	0.001	1.05 1.19	1.10	0.047	1.00 1.21
Learning Disability	N=26,391					N=11,825	
No reported learning disability		1					
Learning disability		1.16	0.121	0.96 1.41	1.14	0.121	0.86 1.51

Obesity

Obesity

Neurodivergence									
N=26,389								N= 11,824	
No reported neurodivergence		1							
Neurodivergence		1.64	<0.001	1.54	1.76	1.42	<0.001	0.86	1.68
Learning Disability									
N=26,391								N=11,825	
No reported learning disability		1							
Learning disability		1.70	<0.001	1.42	2.04	1.45	0.005	1.12	1.88

Hypertension

Hypertension	Sample Size	Year 2016-2019 (Adjusted for Age, Sex and Ethnicity)				Year 2017- 2018 (Additionally, Adjusted for Physical Activity)			
		OR	p-Value	95%CI		OR	p-Value	95%CI	
Neurodivergence	N=16,953					N=7,569			
No reported neurodivergence		1				1			
Neurodivergence		1.51	<0.001	1.40	1.64	1.45	<0.001	1.29	1.62
Learning Disability	N=16,954					N=7,569			
No reported learning disability		1				1			
Learning disability		1.24	<0.001	1.02	1.50	1.29	0.087	0.96	1.73

Summary - Diabetes and Hypertension

- Neurodivergent individuals had 1.5 higher odds of having diabetes, whilst individuals with learning disabilities also had 1.5 times higher odds. These were not fully attenuated after adjusting for physical activity for neurodivergent adults but were for those with learning disabilities.
- Neurodivergent individuals were 1.5 times more likely to have hypertension, the odds increasing upon adjusting for physical activity. Individuals with learning disabilities also had 1.24 times higher odds, which were attenuated in the physical activity subsample.

Summary - Overweight and Obesity

- Neurodivergent participants were almost 64% more likely to have obesity than the general population. Physical activity reduced but did not fully attenuate the risk. Similar results were obtained between learning disabilities and obesity (70% increased risk).
- Neurodivergent adults were at 12% increased risk of overweight (10% when adjusted for physical activity in the subsample. Individuals with learning disabilities were not at increased risk of overweight.

Strategies

- Physical activity alone may not be sufficient to mitigate the risk of obesity, and additional interventions may be required.
- Early interventions targeting neurodivergent groups, for those with overweight, to mitigate obesity could be adopted.
- Some neurodivergent adults demonstrate sensory difficulties and are more selective with what they consume depending on texture, smell, and food temperature (McCoy et al., 2016). This results in diets that may not fit the standard form of healthy eating.
- Thus, health care professionals should provide support and encouragement to identify healthy food options that are not triggering to maintain a healthy lifestyle. (Goff et al., 2021).

Recommendations

- Primary care providers should be made aware that neurodivergent adults are at higher risk of having conditions associated with metabolic syndromes.
- In the UK adults age 14 and over with learning disabilities are offered an annual health check, but in the UK this does not currently include neurodivergent adults due to these conditions not being formally included in this classification. Consultations have been heard regarding extending annual health checks to autistic adults and a pilot is underway. (Department of Health Social Care, 2024).
- The authors support the introduction of these health checks
- This paper is in draft: please contact the lead author before quoting