Age and gender differences in the relationship between obesity and disability with self-perceived employment discrimination: Results from a retrospective study of an Australian national sample

Syed Afroz Keramat a,b,c,*, Khorsed Alam a,c, Rezwanul Hasan Rana a, Suvasish Das Shuvo d, Jeff Gow a,e, Stuart J.H. Biddle c, Byron Keating f

a School of Business, University of Southern Queensland, Toowoomba, QLD, 4350, Australia
b Economics Discipline, Social Science School, Khulna University, Khulna, 9208, Bangladesh
c Centre for Health Research, University of Southern Queensland, QLD, 4350, Australia
d Department of Nutrition and Food Technology, Jashore University of Science and Technology, Jashore, Bangladesh
e School of Accounting, Economics, and Finance, University of KwaZulu-Natal, Durban, 4000, South Africa
f Faculty of Business & Law, Queensland University of Technology, Australia

ARTICLE INFO

Keywords:
Australia
Disability
Employment discrimination
HILDA
Obesity

ABSTRACT

Background: Health status is a crucial determinant of an individuals’ labour market outcomes. The present study investigates the association between obesity and disability with perceived employment discrimination within Australia.

Methods: A total of 17,174 person-year observations from the 11,079 respondents were analysed using four waves of data from the Household, Income, and Labour Dynamics in Australia (HILDA) survey. The primary outcome examined was employment discrimination, using obesity and disability as the main exposure variables. The longitudinal random-effects regression technique was applied to investigate the between-person differences in employment discrimination associated with obesity and disability.

Results: The findings suggest that more than one in ten (12.68 %) Australians experienced employment discrimination. The odds of being discriminated against while applying for a job were 1.56 times (aOR: 1.56, 95 % CI: 1.15–2.11) higher for obese than their healthy weight counterparts in youngest women. Adults with a disability had 1.89 times (aOR: 1.89, 95 % CI: 1.65–2.17) higher odds of being discriminated against than peers without disability.

Conclusion: The results provide evidence that obesity and disability contribute to employment discrimination in Australia. The findings can assist government and related agencies to consider the adequacy of existing discrimination legislation and help organisations to develop appropriate policies to address discrimination against obese and disabled people in their workplaces.

1. Introduction

Obesity and disability are crucial indicators of population health. Globally, the prevalence of obesity has increased rapidly, and it is becoming a major public health concern. Over 650 million people worldwide are classified as obese (World Health Organization, 2020). An increasing rate of obesity is also a significant public health issue in Australia, as in 2019, over one in four adults aged 15 years and over were obese (26 %) (Keramat et al., 2021a). Overweight and obesity were responsible for 7 % of Australia’s total burden of disease and injuries (AIHW, 2017). Like obesity, the prevalence of disability is also rising worldwide. Over one billion people live with some form of disability globally, and this is projected to double by 2050 (World Health Organization, 2018). In 2018, an estimated one in five adults (18 %) were diagnosed with some form of disability in Australia (AIHW, 2019), and around 5.7 % of adults had a severe disability (Australian Bureau of Statistics, 2018). However, a recent study found that over one in four Australian adults (28 %) have some form of disability (Keramat et al., 2021b).

Obesity and disability are responsible for rising adverse labour
market outcomes, such as a high rate of absenteeism (Keramat et al., 2020a), the rise of presenteeism (Keramat et al., 2020b), and low job satisfaction (Keramat et al., 2020c). People experiencing both obesity and disability are often subject to workplace discrimination. For example, a study on European workers revealed that obese workers faced higher discrimination in the hiring process (Flint et al., 2015). Besides, a Canadian study concluded that disabled people faced higher levels of harassment and discrimination in the workplace (Jones et al., 2018). Recent empirical evidence also reveals that workplace harassment and discrimination continue to grow among workers with disabilities in the USA and UK despite protective legislation (Fevre et al., 2013; Snyder et al., 2010). Further, there is evidence that obese people experience higher unemployment levels than healthy-weight peers in the USA (Tunceli et al., 2006). Studies of American adults showed that obesity is associated with several forms of discrimination, including in the workplace (Illume & Williams, 2009; Lewis et al., 2011). A few studies conducted in European countries (e.g., UK (Morris, 2006), Finland (Böckerman et al., 2019; Sarlio-Lahkonen & Lahelma, 1999) and Denmark (Greve, 2008)) found that obese people tend to earn less than their non-obese counterparts and that overweight people were also more likely to report employment discrimination and discriminatory experiences than healthy weight counterparts (Roehling et al., 2007).

Physical disabilities also prevent people from securing continuous employment (Waterhouse et al., 2010). According to the Australian Institute of Health and Welfare (AIHW), people with disabilities are under-represented in the Australian workforce (53% compared to 84% of those without disabilities) (AIHW, 2020), and the rate of employment is declining (AIHW, 2017). The empirical evidence demonstrates that people with psychiatric disabilities have unemployment of longer durations, lower probability of securing highly-paid jobs, have lower earnings, and are denied training opportunities and promotions (Baldwin & Marcus, 2006; Stuart, 2006). There is also evidence that people with physical and sensory impairments face large-scale hiring discrimination in the USA (McMahon, 2012).

Few studies have quantified the longitudinal association between obesity and disability with employment discrimination, and those that do exist have mainly been undertaken in the USA and UK. Longitudinal studies monitor individual changes over time which can evaluate the relationship more accurately than other study designs. No research has examined to what extent people with obesity and disability receive disparate treatment at work in Australia. A longitudinal study on obesity, disability and perceived employment discrimination nexus using Australian data is non-existent.

Therefore, the objectives of the present study are twofold: firstly, to determine the current state of perceived employment discrimination and, secondly, to examine the relationships between obesity and disability with perceived employment discrimination in the Australian adult population. Findings will assist in developing a broader conceptual framework for understanding and tackling obesity and disability-related prejudice and discrimination in a workplace setting and developing more inclusive workplaces in Australia. Moreover, the evidence will assist organisations and the government to develop and implement evidence-based anti-discrimination policies covering weight and disability-related workplace discrimination. Furthermore, the study findings may help policymakers and organisations to develop and implement workplace health promotion programs to reduce obesity problems of employees and increase productivity in the workplace.

2. Methods

2.1. Data source and sample selection

The data utilised in this study were obtained from the Household Income and Labour Dynamics in Australia (HILDA) survey. HILDA is a nationally representative longitudinal study of Australian households that collects information annually from the adult members of the same household. The survey gathers information on a wide range of topics, including wealth, retirement, fertility, health, education, skills, abilities, job-related discrimination, intentions and plans, non-co-residential family relationships, health insurance, youth, literacy and numeracy, diet, and material deprivation from household members aged 15 years or over through both self-completion questionnaires and face-to-face interviews by trained interviewers. The HILDA survey commenced in 2001 and collected information on 19,914 individuals from 7682 households. Since then, the survey gathers information annually from over 17,000 Australians. HILDA survey selects sample households through multi-stage sampling techniques that are representative of the Australian population. A detailed description of the HILDA sampling technique and survey methodology has been outlined elsewhere (Freidin et al., 2002).

This study acquired data from four waves of the HILDA survey: Wave 8 (2008), Wave 10 (2010), Wave 14 (2014), and Wave 18 (2018). These waves were selected as they included specific questions related to employment discrimination. The analytic sample was restricted to respondents aged 15 years or over, and excludes observations with missing values on the outcome variable (employment discrimination) and primary variables of interest (obesity and disability status). These selection criteria resulted in an unbalanced panel comprising 17,174 person-year observations from 11,079 participants.

2.2. Outcome variable

The primary outcome variable of the present study is perceived employment discrimination. Participants aged 15 years or over were asked, “thinking of the jobs you have applied for in the past two years, do you think you were ever unsuccessful because the employer discriminated against you?” Responses to the questions were taken in binary form; 0 indicates no, and 1 indicates yes. This reflects respondents’ perception of discrimination and may not be actual discrimination. Since it is difficult to measure actual labour market discrimination, existing studies have relied on participants’ perceptions (Biddle, 2013; Jones et al., 2018). As data on real labour market discrimination is not available in the HILDA survey, the present study has taken into account the study participants’ perceptions concerning employment discrimination.

2.3. Key explanatory variables

The primary variables of interest of this study are the obesity and disability status of the study participants. One of the primary exposure, obesity, was measured through Body Mass Index (BMI). The HILDA survey collects self-reported weight and height by asking questions, “What is your current weight (kilograms)” and “how tall are you, without shoes (metres)?”, respectively. Each participant’s BMI was then calculated by applying the formula, weight in kilograms divided by height in metres squared. The present analysis categorised BMI into four groups: ‘underweight’ (BMI <18.50), ‘healthy weight’ (18.50 ≤ BMI <25), ‘overweight’ (25 ≤ BMI <30), and ‘obese’ (BMI ≥30) following the World Health Organization’s BMI cut-off points to define an individual’s weight status (World Health Organization, 2020).

Another primary exposure variable of this study is self-reported disability. The HILDA survey collects information on each respondent’s disability status through personal interviews following the definition of the International Classification of Functioning, Disability, and Health (ICF) framework (LaMontagne, Knijacki, Milner, Butterworth, & Kavanaugh, 2016; Lopez Silva et al., 2020). Participants’ disability status was ascertained by asking if they have any long-term health condition, impairment, or disability that restricted their daily activities and has lasted for six months or more. The survey presents 17 categories of disabilities (e.g., sight problems not corrected by glasses or lenses, hearing problems, speech problems, limited use of feet or legs, and chronic or recurring pain) to the respondents to define their
disability status. The responses were taken into binary form (yes and no); yes indicates that the participant has a disability, and no indicates otherwise.

### 2.4. Covariates assessed in the model

This study included a range of covariates to account for confounding effects in the multivariate regression models following previous studies (Biddle, 2013; Jones et al., 2018; Tunceli et al., 2006). The covariates included in the study were age (youngest [15-30]; middle-age [31-50], and oldest [51 and over]), gender (male and female), education (school not completed, year 12/certificate/diploma, and bachelor degree or greater), civil status (partnered and unpartnered), household yearly disposable income quintile (quintile 1 [lowest] to quintile 5 [highest]), labour force status (employed, unemployed, and not in the labour force), indigenous status (non-indigenous, and Aboriginal or Torres Strait Islander), state of residence (New South Wales [NSW], Victoria [VIC], Queensland [QLD], South Australia [SA], Western Australia [WA], Tasmania [TAS], Northern Territory [NT], and Australian Capital Territory [ACT]), and country of birth (Australia or other country).

### 2.5. Estimation methods

The present analysis formed an unbalanced panel data set that includes 17,174 person-year observations from 11,079 unique respondents. The data set was constructed by linking de-identified individuals’ records who participated in any of the four waves (waves 8, 10, 14, and 18) of the HILDA survey spanning the period of 2008–2018. Descriptive statistics in terms of frequency (n) and percentages (%) with 95% Confidence Intervals (CIs) were used to present the pooled characteristics of the study sample. The bivariate relationships between employment discrimination and the primary variables of interest and other covariates were then assessed through chi-square tests. A covariate was included in the adjusted model only if it was statistically significant at 5% in the chi-square test. However, some exceptions have been considered to evaluate whether a variable is statistically significant at any levels in the multivariate regression models despite being insignificant in the chi-square tests. This study employed the longitudinal random-effects logistic regression approach to examine the association between perceived employment discrimination and obesity and disability. The random-effects regression modelling allows identifying the between-person differences in perceived employment discrimination concerning change in obesity and disability. For the present study, the random-effect regression approach is appropriate as this technique considers the effects of a variable that changes over time, such as the age of the individuals (Milner & LaMontagne, 2017). The study conducted both unadjusted and adjusted models. Age, gender, civil status, education, household yearly disposable income, labour force status, indigenous status, state of residence, and country of birth served as the confounders in the adjusted model. Besides, the between-person effect models were stratified by age and gender as part of the sensitivity analysis to examine the differences in employment discrimination associated with obesity and disability. This study replaced missing observations in one covariate, Indigenous status, through imputation (last observation carried forward). However, no survey weights have been used in the analyses.

The test results are displayed in the form of odds ratio with 95% confidence intervals (CIs) along with respective p-values for each variable. A predictor was considered statistically significant if the respective p-value of a particular exposure was less than or equal to 0.05 in the multivariate regression analyses. This study performed all statistical analyses using the statistical software Stata (version 16).

### 3. Results

Table 1 demonstrates the distribution of the study participants’ characteristics in the first and last waves and pooled across all waves. A total of 17,174 person-year observations from 11,079 participants were included in the analyses. Over one in ten adults (12.68%) experienced employment discrimination in Australia. The proportion of employment discrimination reported in the baseline and final waves was 11.58% and 12.52%, respectively. Among the study sample, 18.07% were obese, and 15.90% had a disability in the baseline. The prevalence of obesity (23.47%) and disability (21.13%) were highest in the final waves (Table 1). Table 1 (all waves pooled) also shows that 53.97% were aged

| Table 1 |
| Distribution of the analytic sample: Baseline, final and pooled across all waves (persons = 11,079, observations = 17,174). |
| Characteristics | Baseline wave (2008) | Final wave (2018) | All waves pooled (2008-2018) |
|-----------------|------------------|-----------------|-------------------------|
| n | % | n | % | n | % |
| **Outcome variable** | | | | | | |
| **Perceived employment discrimination** | | | | | | |
| No | 3420 | 88.42 | 4156 | 87.48 | 14,996 | 87.32 |
| Yes | 448 | 11.58 | 595 | 12.52 | 2178 | 12.68 |
| **Exposures and covariates** | | | | | | |
| **BMI** | | | | | | |
| Underweight | 130 | 3.36 | 164 | 3.45 | 593 | 3.45 |
| Healthy weight | 1849 | 47.80 | 2055 | 43.25 | 7785 | 45.33 |
| Overweight | 1190 | 30.77 | 1417 | 29.83 | 5249 | 30.56 |
| Obesity | 699 | 18.07 | 1115 | 23.47 | 3547 | 20.65 |
| **Disability** | | | | | | |
| No | 3253 | 84.10 | 3747 | 78.87 | 14,066 | 81.55 |
| Yes | 615 | 15.90 | 1004 | 21.13 | 3168 | 18.45 |
| **Age** | | | | | | |
| Youngest (15–30 years) | 2069 | 53.49 | 2469 | 51.97 | 9268 | 53.97 |
| Middle-age (31–50 years) | 1389 | 35.91 | 1658 | 34.90 | 5882 | 34.25 |
| Oldest (51 years and over) | 410 | 10.60 | 624 | 13.13 | 2024 | 11.79 |
| **Gender** | | | | | | |
| Male | 1816 | 46.95 | 2303 | 48.47 | 8291 | 48.28 |
| Female | 2052 | 53.05 | 2448 | 51.53 | 8833 | 51.72 |
| **Civil Status** | | | | | | |
| Partnered | 2062 | 53.31 | 2416 | 50.85 | 8915 | 51.91 |
| Unpartnered | 1806 | 46.69 | 2335 | 49.15 | 8259 | 48.09 |
| **Education** | | | | | | |
| School not completed | 1193 | 30.84 | 933 | 19.64 | 4322 | 24.64 |
| Year 12/certificate/diploma | 1814 | 46.90 | 2437 | 51.29 | 8568 | 49.89 |
| Bachelor degree or greater | 861 | 22.26 | 1381 | 29.07 | 4374 | 25.47 |
| **Household yearly disposable income quintile** | | | | | | |
| Quintile 1 (lowest) | 774 | 20.01 | 951 | 20.02 | 3440 | 20.03 |
| Quintile 2 | 775 | 20.04 | 952 | 20.04 | 3430 | 19.97 |
| Quintile 3 | 773 | 19.98 | 948 | 19.95 | 3436 | 20.01 |
| Quintile 4 | 773 | 19.98 | 951 | 20.02 | 3434 | 20.00 |
| Quintile 5 (highest) | 773 | 19.98 | 949 | 19.97 | 3434 | 20.00 |
| **Labour force status** | | | | | | |
| Employed | 3073 | 79.45 | 3685 | 77.56 | 13,224 | 77.00 |
| Unemployed | 347 | 8.97 | 541 | 11.39 | 1949 | 11.35 |
| Not in the labour force | 448 | 11.58 | 525 | 11.05 | 2001 | 11.65 |
| **Indigenous status** | | | | | | |
| Non-indigenous | 3734 | 96.54 | 4173 | 95.48 | 16,401 | 95.50 |
| Aboriginal or Torres Strait Islander | 134 | 3.46 | 267 | 4.52 | 773 | 4.50 |
| **State of residence** | | | | | | |
| NSW | 1057 | 27.33 | 1302 | 27.40 | 4740 | 27.60 |
| VIC | 939 | 24.28 | 1299 | 27.34 | 4463 | 25.99 |
| QLD | 946 | 24.46 | 1075 | 22.63 | 3921 | 22.83 |
| SA | 326 | 8.43 | 373 | 7.85 | 1437 | 8.37 |
| WA | 341 | 8.82 | 394 | 8.29 | 1496 | 8.72 |
| TAS | 120 | 3.10 | 152 | 3.20 | 550 | 3.20 |
| NT | 34 | 0.88 | 38 | 0.80 | 140 | 0.82 |
| ACT | 105 | 2.71 | 118 | 2.48 | 425 | 2.47 |
| **Country of birth** | | | | | | |
| Australia | 3253 | 84.10 | 4012 | 84.45 | 14,388 | 84.07 |
| Other country | 615 | 15.90 | 739 | 15.55 | 2736 | 15.93 |

3
Fig. 1. Point estimates of perceived employment discrimination by age and gender, 2008–2018.

Fig. 2. Point estimates of perceived employment discrimination by age groups, 2008–2018.

Fig. 3. Point estimates of perceived employment discrimination by gender, 2008–2018.
15–30 years, 51.72 % were female, 24.64 % did not complete school, and 51.91 % were partnered. The majority of the participants were employed (77 %), non-indigenous (95.50 %), residing in NSW (27.60 %), and born in Australia (84.07 %).

Fig. 1 shows the distribution of perceived employment discrimination by age and gender. As can be seen, the oldest age group reported the highest rate of employment discrimination for all the survey years. The rate of perceived employment discrimination was highest among the oldest male (33.77 %) in 2014, followed by the oldest female (32.98 %) in 2010.

Fig. 2 presents the trend in the prevalence of perceived employment discrimination by different age groups. The rate of perceived discrimination is highest among the oldest and ranges from 25.61 % (2008) to 29.62 % (2014). The figure also shows that the prevalence of job discrimination among the youngest and middle-age adults is less than 15 % over the study period.

Fig. 3 demonstrates the point in time rates of self-perceived employment discrimination by gender. The figure shows that the job discrimination rate is higher in women than men over the study period. The prevalence of job discrimination in women ranged from 12.48 % (2008) to 13.92 % (2010).

Fig. 4 presents the bivariate association between obesity and disability with self-perceived employment discrimination. The rate of perceived employment discrimination was two times higher among adults with some form of disability. Overweight had the highest rate of employment discrimination for all the survey years. The employment discrimination by gender. The figure shows that the job discrimination among the youngest and middle-age adults is less than 29.62 % (2014). The figure also shows that the prevalence of job discrimination in women ranged from 12.48 % (2008) to 13.92 % (2014).

Table 2 reports the distribution of perceived employment discrimination patterns varied by BMI, disability, and other characteristics of the study participants in the baseline and final waves. The table also shows the bivariate association between the primary exposures and other covariates with perceived employment discrimination using chi-square tests. The prevalence of employment discrimination among the obese was 13.88 % in 2008 and 15.61 % in 2018. However, the rates were comparatively higher among adults with some form of disability. Overweight had the highest rate of employment discrimination for all the survey years.

Table 3 presents the unadjusted and adjusted multivariate regression results. Results of the random-effects logistic model represent the...
between-person differences in perceived employment discrimination through the unadjusted main effects of obesity (Model 1), the unadjusted main effects of disability (Model 2), and the adjusted effects of obesity and disability (Model 3). Models 1 and 2 indicate a strong positive relationship between obesity (OR: 1.61, 95% CI: 1.37–1.89) and disability (OR: 2.73, 95% CI: 2.38–3.12) with employment discrimination in the unadjusted models. However, Model 3 shows that only disability has substantial direct effects on perceived employment discrimination. The results demonstrate that persons with some forms of disability were 1.89 times more likely to be discriminated against in the job market (Model 3).

Results for the other covariates in the model display that middle-aged (aOR: 1.55, 95% CI: 1.34–1.78) and oldest (aOR: 4.26, 95% CI: 3.57–5.08) age groups have higher odds of being discriminated against. Individuals belonging to lower household yearly disposable income quintiles were more likely to be discriminated against. Besides, unemployed (aOR: 2.54, 95% CI: 2.15–2.99) and adults not in the labour force (aOR: 1.48, 95% CI: 1.25–1.76) had a greater discrimination rate compared with employed peers. Further, individuals born outside of Australia (aOR: 1.29, 95% CI: 1.10–1.51) reported increased odds of being discriminated against relative to those born in Australia.

The results from the random-effects logistic regression models to explain the age and gender differences in the relationship between obesity and disability with employment discrimination are presented in Table 4. There is strong evidence that the odds of being discriminated against was 1.56 times (aOR: 1.56, 95% CI: 1.15–2.11) higher in the obese population than peers of healthy weight among the female and youngest age group (Model 2). The results also showed that disability was significantly associated with greater perceived employment discrimination in both male and female youngest and middle-age groups (Models 1–4). However, no significant associations have been observed between disability and perceived job discrimination in both the male and female oldest age groups (Models 5–6).

4. Discussions

This study explored the association between obesity and disability with perceived employment discrimination using longitudinal data. The study results revealed that obesity in the youngest women is responsible for higher employment discrimination. The findings also indicate that disability is significantly associated with higher employment discrimination.

These findings concur with the existing literature concerning the
influence of obesity. Prior research has shown, for example, that individuals with obesity experience employment discrimination (Carr & Friedman, 2005; Tunceli et al., 2006; Vallejo-Torres et al., 2018). Several studies provided evidence that obesity was positively associated with employment discrimination in the form of lower starting salaries, individuals were considered less qualified, less competent, and made to work longer hours (Levine & Schweitzer, 2015; Schulte et al., 2007). There is also evidence that obese people experience discrimination in the initial hiring process for employment (Bartels & Nordstrom, 2013; Flint & Snook, 2014). Our study results confirm that obesity among the Australian youngest women led to higher employment-related discrimination. One of the reasons for this finding could be that managers had negative obesity stereotypes. As a result, obese applicants may be less likely to be invited for an interview and employed (Agerströom & Rooth, 2011). Another potential explanation could be that obese people were perceived as less “successful” and judged as possessing lower leadership qualities than non-obese peers when reviewing applicants’ suitability for employment (Flint et al., 2015; Flint & Snook, 2014; Roehling et al., 2007).

The present findings are consistent with previous studies suggesting that disability is associated with increased workplace harassment and discrimination (Jones et al., 2018; Snyder et al., 2010). Earlier studies provide evidence that disability is associated with increased workplace harassment and discrimination rates due to lower levels of skill and occupational power (Landsbergs et al., 2014; Lopez et al., 2009; Maroto & Pettinicchio, 2014).

Any type of employment or workplace discrimination against a large section of the population is undesirable. The Australian Human Rights Commission Act (1986) and Fair Work Act (2009) specifically protect people from workplace discrimination because of race, colour, sex, age, and physical and mental disability. Despite this protective legislation, this study uncovered workplace discrimination due to obesity and disability in Australia. This issue requires immediate attention, and it is incumbent upon the government to review the adequacy of legislation and for organisations to review the limitations of existing discrimination and employment policies. These reviews should facilitate the involvement of employers in education, advocacy, and workforce development efforts to ensure the rights of obese and disabled workers are protected. Additionally, an educational campaign may be helpful to raise awareness of weight and disability-related discrimination (Kungu et al., 2019). Creating an inclusive, supportive environment for workers with disabilities and other marginalised groups is likely to reduce harassment and discrimination in the workplace.

The current study has several strengths. Previous studies focused on a particular aspect of health while checking its association with employment discrimination and were based on cross-sectional data. However, this study was the first reported empirical study to consider the separate impacts of obesity and disability on employment discrimination. This study also incorporated a large Australian sample to evaluate the relationship between obesity and disability with employment discrimination and considered a wide range of employment discrimination-related factors as covariates. Collectively, these considerations set this study apart from other similar studies.

The present study has several limitations that should be considered when interpreting the findings. First, the study findings might be vulnerable to self-reported bias, as data on BMI, disability, and employment discrimination may be underestimated or overestimated. Secondly, this study did not consider some essential variables, such as the occupational skill set of the respondents, due to data unavailability. Another limitation is that the study focuses on employment discrimination in a particular country setting. Taking into account the limitations of the present study, future studies should investigate more closely how obese and disable people are discriminated against in the workplace. Besides, future research may test if these relationships also exist in different country settings or across countries.

5. Conclusion

This paper is the first to investigate the longitudinal association between obesity and disability with employment discrimination in Australia. It used a nationally representative data set by linking the four waves of the HILDA survey over the period 2008 to 2018. The longitudinal random-effects regression technique was fitted to investigate the differences in employment discrimination due to obesity and disability. The study findings offer clear evidence that obesity and disability were associated with employment discrimination in Australia. The estimated outcomes are significant for Australia and instructive, in general, for other countries with similar labour market characteristics. The authors expect that the findings will support the development of more effective legislation and policies to prevent health-related employment discrimination in the workplace.
Declaration of competing interest

The authors declare that they have no conflicts of interest.

Acknowledgements

The authors would like to thank the Melbourne Institute of Applied Economic and Social Research for providing the HILDA data set. This paper uses unit record data from the Household, Income and Labour Dynamics in Australia Survey (HILDA) conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the authors and should not be attributed to the Australian Government, DSS, or any of DSS contractors or partners. DOI: 10.26193/OFKRRH, ADA Dataverse, V2.

Abbreviations

BMI  Body Mass Index
HILDA  Household, Income and Labour Dynamics in Australia Survey
OR  Odds Ratios
WHO  World Health Organization

Ethics approval

This study did not require ethical approval as the analysis used only de-identified existing unit record data from the HILDA survey. However, the authors completed and signed the Confidentiality Deed Poll and sent it to NCLD (ncldrsearch@dss.gov.au) and ADA (ada@anu.edu.au) before the data applications’ approval. Therefore, datasets analysed and/or generated during the current study are subject to the signed confidentiality deed.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. This research was partially supported by the Australian Government through the Australian Research Council’s Linkage Projects funding scheme (Project: LP1301000666).

Author statement

Seyd Afroz Keramat: Conceptualization, Methodology, Software. Formal analysis, Writing - Original Draft. Khorsheed Alam: Supervision, Data curation, Writing- Original draft preparation. Rezwuanul Hasan Rana: Writing - Original Draft, Visualization, Investigation. Suvasish Das Shuvo: Writing - Original Draft, Validation. Jeff Gow: Supervision, Writing- Reviewing and Editing.: Stuart J.H. Biddle: Supervision, Writing- Reviewing and Editing. Byron Keating: Supervision, Writing-Reviewing and Editing.

Availability of data and materials

The data used for the study were collected from the Melbourne Institute of Applied Economic and Social Research. There are some restrictions on this data, and it is not available to the public. Those interested in accessing this data should contact the Melbourne Institute of Applied Economic and Social Research, The University of Melbourne, VIC 2010, Australia.

References

Agerstrom, J., & Rooth, D.-O. (2011). The role of automatic obesity stereotypes in real hiring discrimination. Journal of Applied Psychology, 96, 790–805. https://doi.org/10.1037/a0021594

AIHW. (2017). Impact of overweight and obesity as a risk factor for chronic conditions: Australian burden of disease study. Australian burden of disease study series no. 11. Cat. No. BGD 12. Canberra: AIHW.

AIHW. (2019). People with disability in Australia 2019: In brief. Canberra: AIHW. Cat. No. DIS 74. Canberra: AIHW. Available: https://www.aihw.gov.au/reports/disability/p eople-with-disability-in-australia/summary

AIHW. (2020). People with disability in Australia. Cat. No. DIS 72. Canberra: AIHW. Available: https://www.aihw.gov.au/reports/disability/people-with-disability-in-australia,

Baldwin, M. L., & Marcus, S. C. (2006). Perceived and measured stigma among workers with serious mental illness. Psychiatric Services, 57, 388–392. https://doi.org/10.1176/appi.ps.57.3.388

Bartels, L. K., & Nordstrom, C. R. (2013). Too big to hire: Factors impacting weight discrimination. Managing Res Rev, 36, 868–881. https://doi.org/10.1108/MBR-06-2012-0134

Biddle, N. (2013). Comparing self perceived and observed labour market discrimination in Australia. Economic papers, 32, 383–394. https://doi.org/10.1111/1759-1441.12444

Bockerman, P., Cavley, J., Viinikainen, J., Lehmivuori, T., Rovio, S., Seppälä, L., et al. (2019). The effect of weight on labor market outcomes: An application of genetic instrumental variables. Health Economics, 28, 65–77. https://doi.org/10.1002/hec.3926

Carr, D., & Friedman, M. A. (2005). Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. Journal of Health and Social Behavior, 46, 244–259. https://doi.org/10.1177/0022146505060030

Fever, R., Robinson, A., Lewis, D., & Jones, T. (2013). The ill-treatment of employees with disabilities in workplaces. Work, Employment & Society, 27, 288–307. https://doi.org/10.1177/0267890112460311

Flint, S. W., Codreanu, S. C., Gomoiu, A., Ivić, V., Zomer, C., et al. (2015). Obesity discrimination in the workplace: “You’re hired”. Journal of European Psychology Students, 6, 64–69. https://doi.org/10.5334/jeps.cu6.64

Flint, S. W., & Snook, J. (2014). Obesity and discrimination. International Journal of Discrimination and the Law, 14, 183–193. https://doi.org/10.1177/1028591714561168

Freidin, S., Watson, N., & Wooden, M. (2002). Household, income and labour Dynamics in Australia (HILDA) survey: Wave (Vol. 1). Melbourne, Greve, J. (2008). Obesity and labor market outcomes in Denmark. Economics and Human Biology, 6, 350–362. https://doi.org/10.1016/j.ehb.2008.09.001

Hunte, H. E. R., & Williams, D. R. (2009). The association between perceived discrimination and obesity in a population-based multicentric and multiethnic adult sample. American Journal of Public Health, 99, 1285–1292. https://doi.org/10.2105/AJPH.2007.128090

Jones, A. M., Finkelstein, R., & Koehoorn, M. (2018). Disability and workplace harassment and discrimination among Canadian federal public service employees. Canadian Journal of Public Health, 109, 79–88. https://doi.org/10.17269/s41997-018-0022-0

Keramat, S. A., Alam, K., Al-Hanawi, M. K., Gow, J., Biddle, S. J. H., & Hashmi, R. (2021a). Trends in the prevalence of adult overweight and obesity in Australia, and its association with geographic remoteness. Scientific Reports, 11, Article 11320. https://doi.org/10.1038/s41598-021-97050-3

Keramat, S. A., Alam, K., Gow, J., & Biddle, S. J. H. (2020a). Gender differences in the longitudinal association between obesity, and disability with workplace absenteeism in the Australian working population. PloS One, 15(5), Article e0233512. https://doi.org/10.1371/journal.pone.0233512, 1–14.

Keramat, S. A., Alam, K., Gow, J., & Biddle, S. J. H. (2020b). A longitudinal exploration of the relationship between obesity , and long term health condition with presenteeism in Australian workplaces , 2006-2018. PloS One, 15(8), Article e0236260. https://doi.org/10.1371/journal.pone.0236260

Keramat, S. A., Alam, K., Gow, J., & Biddle, S. J. H. (2020c). Obesity, long-term health problems, and workplace satisfaction: A longitudinal study of Australian workers. Journal of Community Health, 45, 288–300. https://doi.org/10.1007/s10900-019-00735-5

Keramat, S. A., Alam, K., Sahib, N. J., Gow, J., Biddle, S. J. H., & Al-Hanawi, M. K. (2021b). Self-reported disability and its association with obesity and physical activity in Australian adults: Results from a longitudinal study. SSM Population Health, 14, Article 100765. https://doi.org/10.1016/j.ssmph.2021.100765

Kungu, K., Melius, J., Cannonier, C., & Wanga, V. (2019). Obesity, chronic job discrimination, and psychological well-being in the United States. Journal of Health and Social Behavior, 60, 244–259. https://doi.org/10.1177/0022146519831633

LaMontagne, A. D., Knujiljaci, L., Milner, A., Butterworth, P., & Kavanagh, A. (2016). Psychosocial job quality in a national sample of working Australians: A comparison of persons working with versus without disability. SSM Population Health, 2, 175–181. https://doi.org/10.1016/j.ssmph.2016.03.006

Landbergis, P. A., Graywacz, J. G., & LaMontagne, A. D. (2014). Work organization, job insecurity, and occupational health disparities. American Journal of Industrial Medicine, 57, 495–515. https://doi.org/10.1002/ajim.22126

Levin, E. J., & Schweitzer, M. E. (2015). The affective and interpersonal consequences of obesity. Organizational Behavior and Human Decision Processes, 127, 66–84. https://doi.org/10.1016/j.obhdp.2015.01.002
Lewis, T. T., Kravitz, H. M., Janssen, I., & Powell, L. H. (2011). Self-reported experiences of discrimination and visceral fat in middle-aged African-American and Caucasian women. *American Journal of Epidemiology*, 172, 1223-1231. https://doi.org/10.1093/aje/kwq466

Lopez Silva, C. P., Singh, A., Calache, H., Derbi, H. A., & Borromeo, G. L. (2020). Association between disability status and dental attendance in Australia—a population-based study. *Community Dentistry and Oral Epidemiology*. https://doi.org/10.1111/cdeo.12571

Lopez, S. H., Hodson, R., & Roscigno, V. J. (2009). Power, status, and abuse at work: General and sexual harassment compared. *The Sociological Quarterly*, 50, 3-27. https://doi.org/10.1111/j.1533-8525.2008.01131.x

Maroto, M., & Pettinicchio, D. (2014). Disability, structural inequality, and work: The influence of occupational segregation on earnings for people with different disabilities. *Research in Social Stratification and Mobility*, 38, 76-92. https://doi.org/10.1016/j.rssm.2014.08.002

McMahon, B. T. (2012). An overview of workplace discrimination and disability. *Journal of Vocational Rehabilitation*, 36, 135-139. https://doi.org/10.3233/JVR-2012-0588

Schulte, P. A., Wagner, G. R., Ostry, A., Blancforti, L. A., Catlip, R. G., Krajnak, K. M., et al. (2007). Work, obesity, and occupational safety and health. *American Journal of Public Health*, 97, 428-436. https://doi.org/10.2105/AJPH.2006.086900

Snyder, L. A., Carmichael, J. S., Blackwell, L. V., Cleveland, J. N., & Thornton, G. C. (2010). Perceptions of discrimination and justice among employees with disabilities. *Employee Responsibilities and Rights Journal*, 22, 5-19. https://doi.org/10.1007/s10672-009-9107-5

Stuart, H. (2006). Mental illness and employment discrimination. *Current Opinion in Psychiatry*, 19, 522-526. https://doi.org/10.1097/01.yco.0000238482.27270.5d

Vallejo-Torres, L., Morris, S., & Lopez-Valcarcel, B. G. (2018). Obesity and perceived work discrimination in Spain. *Applied Economics*, 50, 3870-3884. https://doi.org/10.1080/00036846.2017.1400654

Waterhouse, P., Kimberley, H., Jonas, P., & Glover, J. (2010). What would it take? Employer perspectives on employing people with a disability. Adelaide, South Australia. Available: http://ezphost.dur.ac.uk/login?url=https://search.proquest.com/docview/618115957?accountid=14533

World Health Organization. (2018). *Disability and health* [cited 3 Nov 2020]. Available: https://www.who.int/news-room/fact-sheets/detail/disability-and-health

World Health Organization. (2020). *Obesity and overweight* [cited 18 Apr 2021]. Available: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight