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Health Promotion Opportunities for Lesbian, Gay and Bisexual People: Using Data From the New Zealand Health Survey

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ABSTRACT

Issue Addressed: Health inequity for sexual minority (lesbian, gay and bisexual) people compared with heterosexual people is well documented globally. However, limited local data have been used to inform health policy and practice. This project analysed data from the New Zealand Health Survey to determine areas of inequity in health behaviours and identify opportunities for health promotion action.

Methods: We used pooled data from six waves of the New Zealand Health Survey (from 2015/2016 to 2020/2021). The sample for analysis comprised 67 426 people aged 15 years and older, including 1224 sexual minority females and 703 sexual minority males. We applied multiple logistic regression to investigate the association between health behaviours and sexual identity.

Results: Sexual minority people were found to have poorer health behaviours in comparison to heterosexual people in relation to alcohol consumption, smoking, drug use, physical activity and nutrition (eating fruit and vegetables). For example, compared to heterosexual females, female minorities were more likely to be binge drinkers (OR:1.61; 95% CI:1.60, 1.62), current smokers (OR:1.88; 95% CI:1.86, 1.90), drug users (OR:3.23; 95% CI:3.20, 3.25) as well as being less likely to meet fruit (OR:0.84; 95% CI:0.84, 0.85) and vegetable consumption guidelines (OR:0.94; 95% CI:0.93, 0.94). It shows similar patterns of the associations when compared to heterosexual males with male minorities. In relation to physical activity, female minority people were more likely to meet the guidelines compared to heterosexual females.

Conclusion: Our results from the New Zealand Survey data are broadly consistent with the current international literature demonstrating health inequity for sexual minorities compared with heterosexual people in relation to alcohol consumption, smoking, drug use, physical activity and eating fruit and vegetables.

So What? Opportunities exist in New Zealand to improve the health behaviours of sexual minorities, and health promotion agencies should ensure their interventions address the needs of these groups. Health promotion agencies have an ethical and moral responsibility to address these areas of inequity.

1 | Introduction

Health inequities are the differences in health behaviours and outcomes that occur between groups of people and are a pivotal concern in health promotion [1]. In relation to sexual minority people (i.e., lesbian, gay and bisexual - LGB), international evidence collected over more than 30 years identifies these groups as having poorer health behaviours and outcomes across a number of health domains such as alcohol consumption, cigarette smoking and drug use [2, 3]. In this article, we discuss opportunities for health promotion targeted at sexual minorities in New Zealand. Central to the investigation reported is the desirability of using data to guide health promotion actions and solutions [4].

When compared with the robust international evidence, the health inequities experienced by sexual minorities in New Zealand have not been comprehensively identified and reported. Although relevant data about health status, health behaviours, and risk factors, utilisation of and experiences of health services by sexual minorities have been collected in the New Zealand Health Survey since 2015, there is minimal evidence of these data being accessed or used to inform health promotion activity. Making such inequities visible is necessary if they are to be addressed and progress made toward achieving health equity [5].

An early argument in New Zealand was that health issues for sexual minorities would only be addressed if there was sufficient available confirmation data [6, 7]. Nonetheless, there are some areas where central government in New Zealand has shown interest in health promotion for sexual minorities. For example, the incidence of HIV among gay and bisexual men has been well documented since 1989 through a government-funded surveillance program. In tandem, community-led HIV health promotion initiatives have been funded by the government and delivered through the community-based Burnett Foundation Aotearoa (formerly New Zealand AIDS Foundation). This approach has contributed to New Zealand maintaining a low-level and well-controlled incidence of HIV [8, 9], first through health promotion and initiatives championing condom use [10, 11], and more recently through the promotion of HIV Preexposure Prophylaxis (PrEP) [8].

The New Zealand Health Monitor provides data on the mental health of sexual and gender minorities [12]. The New Zealand Government has also provided funding for various mental health, wellbeing and health promotion initiatives targeting sexual and gender minorities. This includes funding for primary mental health services, community-based initiatives and competency training for the mental health and addictions workforces [13].

In 2012 [14] and 2018 [15–17] the New Zealand government's health promotion agency commissioned research into the drinking cultures among LGB and other sexual and gender minority groups. Additionally, a study using New Zealand Health Survey data reported that people with a minority sexual identity engaged in more hazardous alcohol drinking than nonsexual minority people [18]. Despite the strong and clear evidence presented in these studies alongside specific recommended health promotion actions, no significant government or community-led health promotion response to problematic alcohol use by sexual and gender minorities has been implemented [16].

In addition to government-funded studies, several community-led research projects have explored health issues experienced by specific groupings of sexual and gender minority people, including takatāpui/Māori [19], Pacific rainbow [20] and trans and nonbinary people [21]. Some of this research has been influential in encouraging more proactive concern at the government level with the health issues experienced by these groups [22]. One recent and significant government policy action was the identification of people who identify as belonging to a 'Rainbow group' (sexual and gender minorities, including LGB) as a priority focus in Te Pae Tata—the interim national health plan [22, 23].

This study is one of the first to provide a comprehensive investigation of sexual orientation in relation to various health risk behaviours, including alcohol consumption, smoking, drug use, adherence to physical activity guidelines and fruit and vegetable consumption. Previously one study focused only on alcohol consumption [18]. Given this growing interest, it is apposite to identify and quantify the health behaviours of sexual minority people to guide health promotion. This study investigated official government health data in relation to core health behaviours—alcohol consumption, cigarette smoking, drug use, physical activity and nutrition (eating fruit and vegetables). The waves of the New Zealand Health Survey used in our study employed a simple binary gender question, necessitating our focus on diverse sexual identities as data linked to those who identify as trans/gender diverse are not available. Guided by the literature, we established the following hypothesis to guide the study: Sexual minority groups will have poorer health behaviours compared to heterosexual groups.

2 | Methods

2.1 | Study Design and Samples

We used data from the New Zealand Health Survey, spanning six waves from 2015/2016 to 2020/2021. It is a nationally representative survey that employs a multistage sampling method and conducts face-to-face interviews with respondents aged 15 years and older. We combined all six waves of the survey, resulting in a total sample size of 74 228.

We excluded respondents who did not provide data for the main variables of interest, that is, the main outcome variables that were consistent across all six waves of the survey—alcohol consumption, cigarette smoking behaviours, drug use, physical activity and eating vegetables and fruit ($n = 824$) and sexual identity (4408). Additionally, respondents who did not respond to variables used for adjustments in the model were excluded ($n = 1570$). The final sample size used for the analysis was 67 426.

2.2 | Measures

2.2.1 | Main Outcomes

We analysed the main outcome variables that were consistent across all six waves of the survey.

For alcohol consumption, the respondents were asked two main questions: (1) 'Have you had a drink containing alcohol in the last year?' Respondents answered '1, yes' or '2, no'. If respondents answered 'yes', they were asked the second question: 'How often do you have six or more standard drinks on one occasion?' The response choices were '1, never', '2, less than monthly', '3, monthly', '4, weekly', '5, daily or almost daily', 'do not know' and 'refused'. We categorised drinking into two groups: binge and nonbinge drinking. Binge drinkers were those who responded 2–5 in the second question. Nonbinge drinkers are those who responded 'no' in the first question or answered 'never' in the second question.

For cigarette smoking behaviours, three main questions were utilised to determine smoking status (smokers and nonsmokers). The first question asked if participants had ever smoked cigarettes, tobacco, pipes, or cigars, even just a few puffs. Responses included '1, yes', '2, no', 'don't know' or 'refused'. The second question inquired if participants had ever smoked more than 100 cigarettes in their lifetime, with response options of '1, yes', '2, no', 'don't know' or 'refused'. Respondents answering 'yes' to the second question or 'don't know', or 'refused' were asked a third question to determine their current smoking frequency, with response options ranging from '1, I don't smoke now', '2, at least once a day', '3, at least once a month', '4, at least once a month', '5, less often than once a month', along with 'don't know' or 'refused'. Nonsmokers were defined as those who answered 'no' to the first or second question, or selected option 1 in the third question. Smokers included those who responded 'yes' to the second question and those who chose options 2–5 in the third question.

Drug use was measured using the question: 'In the past 12 months, have you used any of the following substances?' The response options were: (1) Cannabis (marijuana, hash, weed), (2) Cocaine, (3) Ecstasy/MDMA, (4) Amphetamine type stimulants, for example, 'P', speed, ice, ritalin, (5) Inhalants, for example, NOS, glue, petrol, poppers, (6) Sedatives or sleeping pills, for example, valium, diazepam, (7) Hallucinogens, for example, LSD, mushrooms, ketamine, (8) Opioids, for example, heroin, morphine, methadone, codeine, (9) Other substances—please specify (e.g., synthetic cannabinoids, 'synnies', GHB, GBL etc.), (0) No, none of the above (cannot be selected with other options). Additionally, participants could choose 'don't know' or 'refused' as responses. We classified individuals who reported using any of the substances listed in choices 1–9 as drug users, while those who selected option 0 were considered nondrug users.

Physical activity was measured using four main questions: number of days and time spent in moderate physical activity and vigorous physical activity. Moderate physical activity was measured using two main questions. First, respondents were asked 'During the last 7 days, on how many days did you do moderate physical activities? The "moderate" activities refer to the stage in which you breathe harder than normal, but only a little—like carrying light loads, bicycling at a regular pace, or other activities and do not include walking of any kind. Think only about physical activities that are done for at least 10 min at a time'. The moderate physical activities were measured using the number of days per week. The second question was: 'How much time you typically spent on each of those days doing moderate physical activities?' Numbers of hours and minutes were recorded. The vigorous physical activities were measured using two main questions. First, 'During the last seven days, on how many days did you do vigorous physical activities? Vigorous activities refer to the stage where you breathe much harder than normal ("huff and puff")—like heavy lifting, digging, aerobics, fast bicycling or other activities. Think only about those physical activities that are done for at least 10 min at a time'. The second question was 'How much time did you typically spend on each of those days doing vigorous physical activities?' The numbers of hours and minutes were recorded. We estimated the number of minutes of moderate and vigorous physical activity by multiplying questions 1 and 2 for each type of physical activity. Later, we categorised respondents into two main groups—those who did sufficient physical activity (moderate physical activities for more than 150 min per week or vigorous physical activities for more than 75 min) and those who did not [24, 25].

The consumption of fruit was assessed with the question: 'On average, how many servings of fruit do you eat per day? (included all fresh, frozen, canned and stewed fruit; do not include fruit juice or dried fruit). A "serving" equals one medium piece or two small pieces of fruit, or ½ cup of stewed fruit. For example, one apple and two small apricots equals two servings'. Participants could choose from the following response options: '1, I don't eat fruit', '2, Less than one serving per day', '3, one serving per day', '4, two servings per day', '5, three servings per day', '6, four or more servings per day', 'don't know' or 'refused'. We categorised fruit consumption behaviours as either sufficient (eating more than two servings of fruit per day) or nonsufficient [25].

For vegetable consumption, the question was: 'On average, how many servings of vegetables do you eat per day? (included all fresh, frozen, and canned vegetables; do not include vegetable juices). A "serving" equals one medium potato/kumara, or ½ cup cooked vegetables, or one cup of salad vegetables. For example, two medium potatoes and ½ cup of peas equals three servings'. Participants could respond with the following options: '1, I don't eat fruit', '2, Less than one serving per day', '3, one serving per day', '4, two servings per day', '5, three servings per day', '6, four or more servings per day', 'don't know' or 'refused'. We categorised vegetable consumption behaviours as either sufficient (eating more than three servings of vegetables per day) or nonsufficient [25]. As the New Zealand guidelines for vegetable consumption changed from three servings to five servings per day in 2020, we used the lower amount.

2.2.2 | Main Independent Variable

2.2.2.1 | Sexual Identity. Respondents were asked, 'Which of the following options best describes how you think of yourself?' The response options were heterosexual or straight, gay or lesbian, bisexual, other (not further defined), don't know, and choose not to answer.

Additionally, we grouped individuals into different sexual identity categories after merging the variable with gender (male and female). We categorised males who chose the responses gay or bisexual as male sexual minorities and females who chose lesbian or bisexual as female sexual minorities. We omitted those

TABLE 1 | Distribution of health behaviours across sexual identity among samples from 2015 to 2021.

Variables	Total (n=67 426) (95% CI)	Heterosexual females (n=37 329) (%) (95% CI)	Minority females (n=1224) (%) (95% CI)	Heterosexual males (n=28 170) (%) (95% CI)	Minority males (n=703) (%) (95% CI)
Drinking status					
Binge drinking	37.8 (37.4, 38.1)	29.6 (29.1, 30.0)	53.8 (51.0, 56.6)	47.5 (46.9, 48.1)	52.5 (48.8, 56.2)
Smoking status					
Current smoking	18.0 (17.7, 18.3)	17.3 (16.9, 17.7)	31.5 (28.9, 34.1)	18.1 (17.7, 18.6)	23.8 (20.7, 27.1)
Drug use					
Yes	14.0 (13.7, 14.2)	10.0 (9.7, 10.3)	40.2 (37.5, 43.0)	17.6 (17.1, 18.0)	34.4 (31.0, 38.0)
Physical activities					
Meeting requirement	56.2 (55.8, 56.5)	51.5 (51.0, 52.0)	55.7 (52.9, 58.5)	62.3 (61.8, 62.9)	55.6 (51.9, 59.3)
Eating fruit					
Meeting requirement	52.9 (52.5, 53.2)	58.1 (57.6, 58.6)	49.0 (46.2, 51.8)	46.2 (45.6, 46.8)	48.1 (44.4, 51.8)
Eating vegetables					
Meeting requirement	58.7 (58.4, 59.1)	63.0 (62.5, 63.5)	55.1 (52.3, 57.9)	53.4 (52.8, 54.0)	53.2 (49.5, 56.9)

Abbreviation: 95% CI: 95% confidence interval.

who reported other sexual orientations, as their specific sexual identities could not be clearly determined.

2.2.3 | Potential Confounding Factors

We also adjusted for key confounding factors that were consistently assessed across all survey waves. These factors encompassed demographic variables, socio-economic indicators, and the survey year.

Demographic variables consisted of age group and ethnicity (Māori and non-Māori). Socioeconomic status was evaluated based on household income, highest educational attainment (categorised as no formal education, secondary level, undergraduate level, postgraduate level and other (e.g., gaining education from overseas)) and employment status (categorised as paid employment, not paid and looking for a job and not paid due to retirement) [26–28].

2.3 | Statistical Analysis

We utilised a 95% confidence interval to examine differences in the percentage of health behaviours (alcohol consumption, smoking behaviours, drug use, physical activity and eating vegetables and fruit) across different sexual identities.

To investigate the association between the five main behaviours and sexual identity, we employed multiple logistic regression. We presented odds ratios and 95% confidence intervals. The model was adjusted for the potential confounders mentioned earlier. Additionally, to account for errors stemming from the study design, we applied weighted analysis in all our analyses.

For the purposes of the analysis, we considered we had a complete case because missing data amounted to less than 10%, and therefore would have only a small effect on the findings [29, 30].

3 | Results

3.1 | The Association Between Sexual Identity and Alcohol Consumption, Smoking Behaviours and Drug Use

Minority females showed a higher percentage of binge drinkers compared to other sexual identity groups (48% [95% CI:47,48] among heterosexual males, 53% [95% CI:49,56] among minority males, 30% [95% CI:29,30] among heterosexual females and 54% [95% CI:51,57] among minority males). We also found similar patterns for smoking behaviours and drug use. For example, 40% of minority females reported drug use, representing a higher percentage compared to individuals of other sexual identities (18% [95% CI:17,18] among heterosexual males, 34% [95% CI:31,38] among minority males, 10% [95% CI:10,10] among heterosexual females and 40% [95% CI:38,43] among minority females) (Table 1).

After adjusting for confounding factors, sexual minority groups (female minority, male minority) were more likely to be binge drinkers compared to heterosexual groups (males and females). For example, the female minority group was 1.61 times more likely to binge drink compared to the heterosexual female group (OR:1.61; 95% CI: 1.60, 1.62) (Table 2).

We found similar patterns when we investigated the association between sexual identity and smoking behaviours and drug use. For example, those in the female minority group were 1.88 times more likely to be current smokers compared to the heterosexual female group (OR:1.88; 95% CI: 1.86, 1.90), and 3.23 times more likely to be drug users compared to the heterosexual female group (OR:3.23; 95% CI: 3.20, 3.25). Moreover, those in the male minority group were 2.26 times more likely to be drug users compared to the heterosexual male group (OR:2.26; 95% CI: 2.24, 2.28). The study found that the magnitude of the relationship was greater among female groups compared to male groups (Table 2).

3.2 | The Association Between Sexual Identity and Physical Activity Levels, Fruit Consumption and Vegetable Consumption

We found the differences in the percentage of those meeting recommended physical activity levels across the different groups, with heterosexual males showing the highest percentage compared to the other groups (62% [95% CI:62, 63] among heterosexual males, 56% [95% CI:52, 59] among minority males, 52% [95% CI:51, 52] among heterosexual females and 56% [95% CI:53, 59] among minority females) (Table 1).

For fruit and vegetable consumption, heterosexual females reported the highest percentage compared to the other groups. For example, for fruit consumption, 58% (95% CI:58, 59) of heterosexual females reported meeting the guidelines compared to less than 50% (95% CI:44, 52) of the samples for the other groups (Table 1). After adjusting for potential confounders, for fruit and vegetable consumption overall, the male minority were more likely to meet the guidelines on servings compared to heterosexual males. For example, the male minority group was 1.24 times more likely to meet vegetable consumption guidelines compared to the heterosexual male group (OR:1.24; 95% CI: 1.23, 1.25), and 1.07 times more likely to meet fruit consumption guidelines compared to the heterosexual male group (OR:1.07; 95% CI: 1.07, 1.08). However, the female minority group was less likely to meet vegetable and fruit consumption guidelines compared to the heterosexual female group. For example, the female minority had 16% less likely to meet fruit consumption guidelines compared to heterosexual female group (OR:0.84; 95% CI: 0.84, 0.85) (Table 3).

After adjusting for confounding factors, female minorities were more likely to meet physical activity levels compared to heterosexual females. Female minorities were 1.08 times more likely to meet recommended physical activity levels compared to heterosexual females (OR:1.08; 95% CI: 1.08,1.09). However, the study found the male minority group was less likely to meet physical activity guidelines compared to the heterosexual male group (OR:0.55; 95% CI: 0.54,0.55) (Table 3).

Additionally, the study found that the Māori group was more likely to engage in risk behaviours, including binge drinking, smoking, and drug use, and was less likely to meet the recommended guidelines for fruit and vegetable consumption. However, the study also found that the Māori group was more likely to meet the physical activity guidelines. We also found high magnitudes of odds ratios of binge drinking when comparing years of survey using the reference year of 2015/2016.

4 | Discussion

To our knowledge, this is the first time New Zealand Health Survey data have been used to explore core health behaviours among people with diverse sexual identities. We found clear health inequities among people with diverse sexual identities compared to heterosexual people with regard to alcohol consumption, smoking, drug use, physical activity and eating fruit and vegetables. The areas of health inequity identified in the current study reflect inequities reported elsewhere but importantly confirm these inequities are also experienced by LGB people in New Zealand.

In relation to alcohol use, our data are consistent with international research reporting a higher prevalence of alcohol consumption among sexually diverse people than heterosexual people. Specifically, a recent systematic review found a considerably higher prevalence of heavy episodic drinking (or binge drinking) among LGB people compared with heterosexual people [31]. Similarly, as reported in the United States and Canada [32–34], our data also demonstrate inequities in relation to adult cigarette smoking. Inequities in drug use identified in this study also align with other research findings, including from nationally representative UK survey samples showing elevated substance use among sexual minority groups compared with heterosexual groups [35]. Furthermore, our findings on physical activity levels and consumption of fruit and vegetables among sexually diverse people are consistent with a systematic review identifying that physical activity guidelines are less likely to be met by sexually diverse people, as are dietary recommendations for fruit and vegetable consumption [36].

The associations identified between sexual identity and alcohol consumption, smoking and drug use were more prominent than the associations between physical activity levels, fruit consumption and vegetable consumption. The results clearly identified multiple areas of health inequity for LGB and provide strong evidence to support health promotion attention and intervention in these areas. This information obtained from routinely collected data can be used by health promotion agencies and service providers, and by public health professionals and LGB community leaders, to advocate for health agencies to prioritise, develop and deliver preventative health initiatives to address these areas of inequity. In parallel to health promotion action, we note a complimentary focus on primary health care for LGB is also warranted [37].

While the prevalence of sexual minority New Zealanders is comparatively small (3.7%) [38], they are nonetheless an increasing population, especially among younger people [39]. Additionally, from a human rights perspective, the focus on health behaviours and outcomes is a matter of social justice [40], and small groups cannot be ignored in an environment where everyone has the right to the highest attainable standard of health [41]. Indeed, the New Zealand Ministry of Health's stated position is that avoidable differences in health between groups are unfair and unjust [42]. Health promotion agencies should ensure they make full use of existing data to identify those areas of health inequity [15].

Addressing many of these health issues is likely to be challenging. Previous research has, for example, demonstrated that health behaviours such as heavy use of alcohol can be justified and not considered problematic by sexual (and gender) minorities, despite exceeding safe-drinking guidelines

TABLE 2 | Association between sexual identity, and alcohol consumption, smoking and drug use using multiple logistic regression (males: $n = 28\,873$; females: $n = 38\,553$).

Variables	Alcohol consumption OR (95% CI) Male group	Alcohol consumption OR (95% CI) Female group	Smoking OR (95% CI) Male group	Smoking OR (95% CI) Female group	Drug use OR (95% CI) Male group	Drug use OR (95% CI) Female group
Sexual identity (ref. heterosexual group)						
Sexual minority	1.05 (1.05, 1.06)	1.61 (1.60, 1.62)	1.31 (1.30, 1.33)	1.88 (1.86, 1.90)	2.26 (2.24, 2.28)	3.23 (3.20, 3.25)
Age group (ref. 15–24 years)						
25–34	1.11 (1.10, 1.11)	0.84 (0.83, 0.84)	2.33 (2.31, 2.34)	2.70 (2.68, 2.71)	1.02 (1.02, 1.03)	0.65 (0.64, 0.65)
35–44	0.85 (0.85, 0.86)	0.64 (0.64, 0.64)	2.01 (2.00, 2.03)	2.58 (2.57, 2.60)	0.67 (0.66, 0.67)	0.40 (0.40, 0.40)
45–54	0.82 (0.82, 0.83)	0.56 (0.55, 0.56)	1.73 (1.72, 1.74)	2.33 (2.31, 2.34)	0.50 (0.50, 0.51)	0.34 (0.34, 0.34)
55–64	0.55 (0.55, 0.56)	0.29 (0.29, 0.29)	1.30 (1.29, 1.31)	1.57 (1.55, 1.58)	0.30 (0.30, 0.30)	0.17 (0.17, 0.17)
65–74	0.50 (0.50, 0.51)	0.18 (0.18, 0.18)	0.66 (0.66, 0.67)	0.72 (0.71, 0.73)	0.11 (0.11, 0.11)	0.06 (0.06, 0.07)
75+	0.22 (0.22, 0.23)	0.06 (0.06, 0.06)	0.25 (0.25, 0.25)	0.27 (0.27, 0.28)	0.02 (0.02, 0.02)	0.02 (0.02, 0.02)
Household income (ref.$1–$20 000)						
$20 001–$30 000	0.83 (0.82, 0.84)	0.97 (0.96, 0.98)	0.95 (0.94, 0.96)	0.82 (0.81, 0.83)	1.06 (1.05, 1.08)	1.20 (1.18, 1.21)
$30 001–$50 000	0.90 (0.89, 0.90)	0.88 (0.87, 0.89)	0.63 (0.62, 0.64)	0.64 (0.64, 0.65)	0.67 (0.67, 0.68)	0.84 (0.83, 0.85)
$50 001–$70 000	0.88 (0.87, 0.89)	0.91 (0.90, 0.91)	0.61 (0.60, 0.62)	0.51 (0.50, 0.51)	0.59 (0.59, 0.60)	0.78 (0.77, 0.78)
$70 001–$100 000	1.00 (0.99, 1.01)	1.04 (1.04, 1.05)	0.42 (0.41, 0.42)	0.40 (0.39, 0.40)	0.52 (0.51, 0.52)	0.62 (0.62, 0.63)
$100 001 or more	1.24 (1.23, 1.25)	1.14 (1.13, 1.15)	0.34 (0.34, 0.34)	0.28 (0.28, 0.28)	0.56 (0.56, 0.57)	0.60 (0.60, 0.61)
Missing data	0.84 (0.83, 0.84)	0.92 (0.91, 0.93)	0.62 (0.61, 0.62)	0.51 (0.51, 0.52)	0.50 (0.49, 0.50)	0.64 (0.63, 0.65)
Highest education qualification (ref. no formal education)						
Secondary level	1.09 (1.09, 1.10)	1.17 (1.17, 1.18)	0.80 (0.79, 0.80)	0.88 (0.88, 0.88)	1.05 (1.04, 1.05)	1.07 (1.07, 1.08)
Undergraduate level	0.91 (0.91, 0.92)	0.87 (0.87, 0.88)	0.53 (0.53, 0.54)	0.42 (0.42, 0.42)	0.86 (0.86, 0.87)	0.91 (0.90, 0.92)
Postgraduate level	0.47 (0.47, 0.47)	0.61 (0.60, 0.61)	0.21 (0.21, 0.22)	0.15 (0.15, 0.15)	0.55 (0.55, 0.56)	0.75 (0.75, 0.76)
Other (e.g., gaining education from overseas)	0.79 (0.79, 0.80)	0.74 (0.73, 0.75)	0.62 (0.62, 0.63)	0.76 (0.75, 0.77)	0.82 (0.81, 0.83)	0.74 (0.73, 0.75)
Employment (ref. working)						
Unemployed (looking for a job)	0.86 (0.85, 0.87)	0.84 (0.83, 0.84)	1.85 (1.84, 1.87)	1.50 (1.49, 1.52)	1.50 (1.49, 1.51)	1.32 (1.31, 1.33)
Unemployed (e.g., students, retired)	0.47 (0.47, 0.47)	0.56 (0.55, 0.56)	0.77 (0.76, 0.77)	0.97 (0.96, 0.97)	0.75 (0.74, 0.75)	0.75 (0.74, 0.75)
Māori (ref. non-Māori)	1.74 (1.74, 1.75)	2.50 (2.49, 2.51)	1.96 (1.95, 1.97)	3.67 (3.66, 3.69)	2.32 (2.31, 2.33)	2.58 (2.57, 2.60)
Year of the survey (ref. 2015/2016)						
2016/2017	4.15 (4.13, 4.17)	3.47 (3.45, 3.49)	0.94 (0.94, 0.95)	0.97 (0.97, 0.98)	1.08 (1.07, 1.08)	0.92 (0.91, 0.93)
2017/2018	4.34 (4.32, 4.36)	3.71 (3.69, 3.73)	0.97 (0.96, 0.97)	0.97 (0.96, 0.97)	1.12 (1.11, 1.13)	1.11 (1.11, 1.12)

(Continues)

TABLE 2 | (Continued)

Variables	Alcohol consumption OR (95% CI) Male group	Alcohol consumption OR (95% CI) Female group	Smoking OR (95% CI) Male group	Smoking OR (95% CI) Female group	Drug use OR (95% CI) Male group	Drug use OR (95% CI) Female group
2018/2019	4.32 (4.30, 4.34)	3.49 (3.47, 3.51)	0.97 (0.97, 0.98)	0.96 (0.96, 0.97)	1.61 (1.60, 1.62)	1.42 (1.41, 1.43)
2019/2020	4.31 (4.28, 4.33)	3.68 (3.66, 3.70)	0.87 (0.87, 0.88)	0.97 (0.97, 0.98)	1.51 (1.50, 1.52)	1.63 (1.61, 1.64)
2020/2021	4.32 (4.30, 4.34)	3.63 (3.61, 3.65)	0.69 (0.69, 0.70)	0.76 (0.75, 0.76)	1.41 (1.40, 1.42)	1.70 (1.69, 1.71)

Abbreviation: OR: odds ratio.

TABLE 3 | Association between sexual identity, and meeting physical activity, fruit and vegetable consumption levels using multiple logistic regression (males: $n = 28\,873$; females: $n = 38\,553$).

Variables	Physical activity OR (95% CI) Male group	Physical activity OR (95% CI) Female group	Fruit consumption OR (95% CI) Male group	Fruit consumption OR (95% CI) Female group	Vegetable consumption OR (95% CI) Male group	Vegetable consumption OR (95% CI) Female group
Sexual identity (ref. heterosexual female)						
Male minority	0.55 (0.54, 0.55)	1.08 (1.08, 1.09)	1.07 (1.07, 1.08)	0.84 (0.84, 0.85)	1.24 (1.23, 1.25)	0.94 (0.93, 0.94)
Age group (ref. 15–24 years)						
25–34	0.72 (0.72, 0.72)	0.84 (0.83, 0.84)	0.85 (0.85, 0.85)	0.73 (0.72, 0.73)	1.16 (1.15, 1.16)	1.06 (1.05, 1.06)
35–44	0.60 (0.60, 0.60)	0.86 (0.86, 0.87)	0.97 (0.96, 0.97)	0.81 (0.80, 0.81)	1.26 (1.25, 1.27)	1.32 (1.32, 1.33)
45–54	0.66 (0.66, 0.66)	0.96 (0.96, 0.97)	0.95 (0.95, 0.96)	0.81 (0.81, 0.82)	1.46 (1.46, 1.47)	1.49 (1.48, 1.50)
55–64	0.68 (0.68, 0.68)	1.05 (1.04, 1.05)	1.08 (1.07, 1.08)	1.20 (1.20, 1.21)	1.77 (1.76, 1.78)	2.01 (2.00, 2.02)
65–74	0.74 (0.74, 0.74)	1.08 (1.08, 1.09)	1.42 (1.41, 1.43)	1.64 (1.63, 1.65)	2.41 (2.40, 2.42)	2.78 (2.77, 2.80)
75+	0.55 (0.55, 0.55)	0.61 (0.61, 0.61)	1.82 (1.81, 1.84)	1.88 (1.87, 1.89)	2.91 (2.89, 2.93)	2.44 (2.43, 2.46)
Household income (ref.$1–$20 000)						
$20 001–$30 000	1.20 (1.19, 1.22)	1.26 (1.26, 1.27)	1.13 (1.12, 1.14)	1.17 (1.16, 1.17)	1.25 (1.24, 1.26)	1.05 (1.04, 1.06)
$30 001–$50 000	1.48 (1.47, 1.49)	1.51 (1.50, 1.52)	1.26 (1.25, 1.27)	1.16 (1.15, 1.17)	1.72 (1.70, 1.73)	1.43 (1.42, 1.44)
$50 001–$70 000	1.74 (1.72, 1.75)	1.54 (1.53, 1.55)	1.39 (1.37, 1.40)	1.40 (1.39, 1.41)	1.70 (1.69, 1.72)	1.71 (1.70, 1.73)
$70 001–$100 000	1.74 (1.72, 1.75)	1.48 (1.47, 1.49)	1.43 (1.42, 1.44)	1.52 (1.51, 1.53)	2.00 (1.98, 2.01)	1.89 (1.87, 1.90)
$100 001 or more	1.76 (1.75, 1.78)	1.65 (1.64, 1.66)	1.59 (1.57, 1.60)	1.66 (1.65, 1.67)	2.29 (2.27, 2.30)	2.36 (2.34, 2.38)
Missing data	1.24 (1.23, 1.25)	1.05 (1.04, 1.06)	1.34 (1.33, 1.36)	1.32 (1.31, 1.33)	1.42 (1.41, 1.43)	1.39 (1.38, 1.40)
Highest education qualification (ref. no formal education)						
Secondary level	1.20 (1.19, 1.20)	1.28 (1.28, 1.29)	1.13 (1.12, 1.13)	1.23 (1.23, 1.24)	1.00 (0.99, 1.00)	1.13 (1.13, 1.14)
Undergraduate level	1.12 (1.12, 1.13)	1.33 (1.33, 1.34)	1.33 (1.33, 1.34)	1.67 (1.66, 1.67)	0.98 (0.97, 0.98)	1.36 (1.36, 1.37)
Postgraduate level	0.93 (0.93, 0.94)	1.14 (1.14, 1.15)	1.99 (1.97, 2.00)	2.00 (1.99, 2.01)	0.96 (0.95, 0.96)	1.33 (1.32, 1.34)
Other (e.g., gaining education from overseas)	1.05 (1.04, 1.05)	1.11 (1.11, 1.12)	1.27 (1.27, 1.28)	1.48 (1.47, 1.49)	0.92 (0.91, 0.93)	1.21 (1.20, 1.22)

(Continues)

TABLE 3 | (Continued)

Variables	Physical activity OR (95% CI) Male group	Physical activity OR (95% CI) Female group	Fruit consumption OR (95% CI) Male group	Fruit consumption OR (95% CI) Female group	Vegetable consumption OR (95% CI) Male group	Vegetable consumption OR (95% CI) Female group
Employment (ref. working)						
Unemployed (looking for a job)	0.48 (0.48, 0.48)	0.78 (0.77, 0.78)	0.76 (0.76, 0.77)	0.91 (0.90, 0.91)	0.88 (0.87, 0.89)	0.92 (0.92, 0.93)
Unemployed (e.g., students, retired)	0.58 (0.58, 0.58)	0.83 (0.83, 0.83)	0.94 (0.93, 0.94)	1.04 (1.04, 1.04)	1.07 (1.06, 1.07)	1.06 (1.05, 1.06)
Māori (ref. non-Māori)	1.25 (1.24, 1.25)	1.14 (1.13, 1.14)	0.96 (0.96, 0.96)	0.86 (0.86, 0.86)	1.17 (1.17, 1.18)	0.94 (0.94, 0.95)
Year (Ref.2015/2016)						
2016/2017	1.09 (1.08, 1.09)	1.12 (1.12, 1.13)	0.93 (0.93, 0.93)	0.89 (0.88, 0.89)	0.92 (0.92, 0.93)	1.00 (1.00, 1.00)
2017/2018	1.21 (1.21, 1.22)	1.16 (1.15, 1.16)	0.99 (0.98, 0.99)	0.93 (0.93, 0.93)	0.86 (0.86, 0.87)	0.98 (0.98, 0.99)
2018/2019	1.01 (1.00, 1.01)	1.00 (1.00, 1.01)	0.82 (0.82, 0.82)	0.75 (0.74, 0.75)	0.59 (0.59, 0.59)	0.68 (0.68, 0.68)
2019/2020	1.02 (1.02, 1.03)	1.05 (1.04, 1.05)	0.84 (0.84, 0.84)	0.68 (0.67, 0.68)	0.62 (0.61, 0.62)	0.69 (0.69, 0.70)
2020/2021	1.06 (1.06, 1.07)	1.08 (1.07, 1.08)	0.77 (0.77, 0.78)	0.58 (0.57, 0.58)	0.54 (0.54, 0.55)	0.59 (0.59, 0.59)

Abbreviation: OR: odds ratio.

[15]. Underpinning such behaviours is the notion of (minority) stress caused by the experiences of living in environments where discriminatory social norms are pervasive [39, 43] and where many of the social and commercial determinants of health have a deleterious impact on health and wellbeing for these groups [17, 22]. A key strategy to ensuring health promotion initiatives are inclusive, affirming and responsive for LGB is the genuine engagement of them in the design and delivery of the initiatives [15, 17].

The health behaviours reported in this study (e.g., poor intake of fruit and vegetables) are experienced by many New Zealanders, not just LGB. We argue that while actions to address these issues need to be universal and aimed at the whole population, additional targeted actions should also be implemented to address the specific disadvantage experienced by sexual minorities [44]. Such actions should be comprehensive, incorporating the focus areas outlined in the Ottawa Charter of enhancing individuals' skills and capabilities, but also addressing social, environmental, and economic determinants of health [45]. For sexual minorities, these actions must take account of the specific impacts on health due to experiences of stigma, discrimination and exclusion [15, 39].

The study found that Māori groups were more likely to engage in risk behaviours, which is consistent with findings from previous studies [46, 47]. Moreover, the study found that the prevalence of binge drinking was higher in the more recent survey years compared to 2015–2016, highlighting growing concerns about the increasing trend of binge drinking in New Zealand. This underscores the need for effective interventions to address the issue, as binge drinking is associated with acute alcohol-related harms.

4.1 | Strengths and Limitations

The chief strength of this study is the use of a large nationally representative population-based sample that explores a comprehensive range of health issues. However, despite using the most robust data available on the health of sexual minority people in New Zealand, a potential limitation relates to the collection of information about the sexuality of respondents. Sexual minority people are known to be underreported in population surveys [48, 49]. It is not possible to know how comfortable respondents to the New Zealand Health Survey were in identifying as gay, lesbian or bisexual, or how accurate the responses given were. This concern is pertinent given that testing for the New Zealand census has also identified reticence among some people to answer questions about sexuality [50]. In addition, the data collection processes for the New Zealand Health Survey assume a binary conceptualisation of gender (male/female) [39]. It is possible some people with a nonmale or nonfemale gender identity may not have taken part or been forced to use a label they were not comfortable with. There are some limitations in the data analysis. First, we applied pooled data analysis which may not reflect the change of association over time; however, we considered the change by adjusting the year of the survey in the logistic regression models. Second, for binge drinking, we categorised only binary variables (binge or nonbinge); we did not consider the regularity of binge drinking. This limitation is also applied for smoking. Third, we excluded respondents who selected 'other' and did not answer for sexual identity, as their specific sexual orientation could not be clearly identified; this could be addressed in future surveys to clarify this group. Fourth, we did not examine the interaction between sexual minority status and other factors; future research should explore these interactions to provide more nuanced insights and inform clearer policy recommendations. Specifically, the study did not examine the interaction between sexual orientation and Māori ethnicity, as the primary objective was to focus on the relationship between sexual orientation and health behaviours. Additionally, the limited sample size for sexual orientation, particularly after stratifying the analysis by sex, restricted our ability to test such interactions. Nonetheless, as these intersectional relationships are important, future studies should be designed to explore this.

5 | Conclusion

This study used a large, nationally representative population-based survey to examine health behaviours of sexual minority people. In line with international evidence, this research identified that health inequities exist for LGB in New Zealand with regard to alcohol consumption, smoking, drug use, physical activity and nutrition for sexual minorities in New Zealand when compared with heterosexual people. This information was previously not available. Health promotion agencies should ensure all their activities routinely consider the needs of LGB populations and develop targeted interventions as appropriate. These agencies have both an ethical and moral responsibility (and opportunities) to address these areas of inequity.

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Ethics Statement

This project did not involve human participants. Following the research practices of Massey University, it was evaluated by the research team and by a peer independent researcher and judged to be of low risk. Consequently, it was not reviewed by one of the University's human ethics committees. The authors of the article were responsible for the ethical conduct of this research.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the results of this study are not publicly available due to the conditions of access stipulated by the data custodians (Statistics New Zealand).

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