



Suicide among hospitality workers in Australia, 2006–2017

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Abstract

Purpose Suicide among hospitality workers has recently attracted attention in the media. To date, little is known about suicide among hospitality workers in Australia.

Methods Suicide data were obtained from the National Coronial Information System (NCIS). Occupational suicide rates were calculated using the Australian Bureau of Statistics population-level data from the 2011 census. Negative binomial regression, univariate logistic regression, and multivariate logistic regression were used to estimate the association between suicide and employment as a hospitality worker over the period 2006–2017, compared to all other occupations.

Results Suicide rates for chefs was significantly higher than for persons in non-hospitality occupations [incidence rate ratio (IRR), 3.93; 95% CI 2.53–5.79; $P < 0.001$]. The interaction between occupation and sex was examined with follow-up testing. Suicide rates for female chefs were significantly higher than for females in non-hospitality occupations (IRR, 3.93; 95% CI 2.60–5.94). Suicide rates for male chefs were also significantly higher than males in non-hospitality occupations (IRR, 1.38; 95% CI 1.14–1.67). Compared with non-hospitality occupations, hospitality workers who died by suicide had significantly greater odds of being female (OR 0.63, 95% CI 0.50–0.79), residing in residential Socio-Economic Indexes for Areas (SEIFA) classified as most disadvantaged (OR 1.62, 95% CI 1.19–2.20), and being born outside of Australia (OR 1.74, 95% CI 1.34–2.25).

Conclusion Results indicate the need for targeted prevention of suicide by Australian hospitality workers. Overall, results suggest that specific hospitality occupations present a higher risk of suicidal behaviour than other non-hospitality occupations.

Keywords Suicide prevention · Occupations · Epidemiology · Public Health

Introduction

The suicide deaths of several high-profile Australian [1, 2] and international chefs [3–5] have brought suicide and mental illness within the hospitality industry to the forefront in the past few years, yet there is limited research investigating suicide risk among those employed in hospitality occupations. Only two occupational studies have examined hospitality employment at time of suicide death, one of which was a review of occupation-specific suicides in England and Wales [6]. This study found that suicide rates amongst butchers increased by 45.1% between 1979–1980/1982–1983 (16.1 per 100,000) and 2001–2005 (23.4 per 100,000) [6], and this increase was thought to be related to deteriorating

socio-economic conditions between the 1979 and 2005 in England and Wales [6]. The second study was an analysis of occupation-specific suicide risk in England between 2011 and 2015, which found that females aged 20–64 years who were bar staff and waitresses at their time of death had the second and fourth highest levels of suicide risk relative to the general employed population [7]. For males, bakers and confectioners aged 20–64 years had the twelfth highest level of risk relative to the general employed population [7]. Such findings align with a comprehensive systematic review and meta-analysis of suicide by occupation (not specifically hospitality focused), which found that lower skilled occupations, including restaurant service workers, posed a considerably greater risk of suicide than higher skilled occupations [8]. However, no study to date has examined hospitality occupations independently from other occupations.

The health of the general working population is known to be particularly affected by psychosocial working environments. Past research suggests that poor psychosocial

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working environments are a risk factor for male suicide, with those employed in occupations that are low in job control and high in job demand being most at risk of suicide [9, 10]. Job-related strain has also been shown to contribute to an inequitable depression risk among workers in lower skill level jobs [11]. Hospitality work is typically characterised by high work intensity (high demand), limited autonomy (low control), long and unsociable working hours, low pay, and poor physical working conditions [12–14], which may lead to adverse health outcomes. Low workplace support has specifically been observed amongst chefs, alongside high rates of violence, aggression, and bullying within kitchen environments [15, 16]. Most Australian hospitality workers are employed on a casual basis (79%) resulting in irregular hours and income instability [17], which may also negatively affect the mental health of this workforce [18].

Hospitality is among one of Australia's biggest industries, providing jobs to 4% of the total employed population [19]. Despite the size of this industry, the authors are not aware of any published research on suicide risk among hospitality workers, which is concerning inasmuch that this means there is no evidence-base for which to draw on to determine the optimal actions for workplace-specific suicide prevention efforts. This lack of evidence to guide preventive efforts is even more concerning when considering that this is a workforce who are particularly susceptible to negative effects from external forces, such as economic crises. As many hospitality businesses require a sustainable customer base to be economically viable, periods of recession in which people are less likely to spend money on non-essential items may lead to an increase in job insecurity within hospitality sector. There is evidence to suggest that insecure employment may be as harmful to overall health as unemployment [20]. Insecure employment has also been associated with increased risk of suicidal ideation amongst persons aged 18–37 years [21]. These findings are worrying given the world has recently experienced another period of significant economic stress and recession as a result of the COVID-19 pandemic, which saw the temporary closure of hospitality businesses during lock down periods worldwide [22]. While business closures may have been periodic and temporary, the mental health effects resulting from temporary unemployment can be enduring, with evidence that, on average, that people do not return to their baseline levels of life satisfaction even years after reemployment [23]. Job insecurity during economic recession may also disproportionately affect migrant workers, who comprise 39% of the hospitality workforce in Australia [24], and are ineligible for state support [25]. A better understanding of suicide risk in the hospitality industry is timely, not only to understand if there is a suicide problem in Australia that needs addressing, but also which hospitality occupations are most at risk, e.g., chefs, bar staff, waiters, butchers. It will also be important to understand the

risk factors for suicide in this sector, as this will enable the identification, development, and/or modification of interventions that could help employers to respond appropriately to the needs of, and threats facing, their workforce to reduce suicide risk.

Using a national register of occupationally coded suicide incidents over a 12-year period (2006–2017) in Australia, this study aims to:

1. Examine rates of suicide by specific hospitality occupations and compare these with data for suicides by people in other occupations.
2. Determine whether suicide rates within specific hospitality occupations differ between males and females.
3. Determine whether demographic and socio-economic characteristics differs for hospitality workers who die by suicide compared with these data for people in other occupations.

Methods

Study design and sample

This retrospective cohort design utilised all closed suicide death cases from the National Coronial Information System (NCIS) for the period of 2006–2017 in Australia. The NCIS is an online database that monitors and records deaths reported to a coroner in Australia and New Zealand. The NCIS system is comprised of information collected from source coronial file documents including coronial findings, police reports, autopsy reports, and toxicology reports. Fact of death and demographic information reported by the coroner, including employment status and occupation, are abstracted by NCIS custodians. For this study, suicide was classified according to the International Classification of Diseases 10th revision (ICD-10), codes X60–X84 [26].

This study included all employed persons aged between 16 and 74 years who died by suicide with a known occupation at the time of their death. Cases were excluded if unemployed at the time of death, employment status was unknown, or if the age at the time of death was not between 16 and 74 years, which was the age range at death for recorded NCIS hospitality occupation suicides.

Ethical approval was granted by the Justice Human Research Ethics Committee (CF/19/30711).

Ascertainment of occupational groups

Employed persons were firstly identified from the NCIS report and then mapped to Australian and New Zealand Standard Classification of Occupations (ANZSCO) codes. The ANZSCO is used to classify occupations within the

NCIS and are maintained by the Australian Bureau of Statistics (ABS) [27]. Occupation text descriptions were coded by at least three researchers according to ANZSCO up the 6-digit level [28]. For records where there was disagreement, the record was coded according to the two researchers in agreement.

Occupations were then divided into two broad groups: hospitality occupations, and all other occupations. “Hospitality occupations” included all hospitality-related occupations classified by ANZSCO as professions, based on the educational and skill requirements for the job [28]. We analysed data for hospitality occupations (codes 351x and 431x) and seven hospitality occupation subgroups: bakers and pastry cooks (code 3511), bar attendants and baristas (code 4311), butchers and smallgoods (i.e., processed meat) makers (code 3512), chefs (code 3513), cooks (code 3514), waiters (code 4315), and other hospitality professions, which included café workers (code 4312), food trades workers not further defined (nfd) (code 3510), gaming workers (code 4313), hospitality workers nfd (code 4310), hotel service managers (code 4313), and other hospitality workers (4319). The “other hospitality professions” group was used due to low counts among these hospitality occupations. The “all other occupations” comparison group included individuals who were employed in any other occupation at the time of death.

Ascertainment of population size

Occupation populations were extracted using the 2011 ABS Census (midpoint of the study), by ANZSCO occupation unit group of main job, age and sex, using ABS TableBuilder [29]. Age was coded into 15-year bands.

Demographic and socioeconomic variables

Demographic and socio-economic variables considered were sex, age at time of death, marital status, country of birth, and index of relative socio-economic advantage and disadvantage (IRSAD) score matched to national decile rankings from the socio-economic indexes for areas (SEIFA) [30].

Statistical analysis

Age and sex were reported for individuals in hospitality occupations, hospitality occupation subgroups and other occupations. Crude suicide rates per 100,000 person years were calculated for each group, stratified by sex. These rates were age-standardised to the 2001 Australian standard population [31] limiting the standard population to those aged 16–74 years. Significant differences in these rates were indicated by non-overlapping 95% confidence intervals (95% CIs).

Negative binomial regression models were used to investigate the rate ratios (RR) in suicide by hospitality workers, with all other occupations as the reference. Negative binomial regression was chosen over Poisson regression following identification of over-dispersion in the Poisson regression model. The initial negative binomial regression model controlled for age group (16–29 years, 30–44 years, 45–59 years, 60–74 years), sex and year of death, with occupation populations used as the offset. Variations between occupation group and sex were tested by re-running the aforementioned model but with an added interaction term. The interaction model was compared against the initial model with no interaction terms. The significance of the interaction was assessed using the likelihood ratio test (LRT). Coefficients were transformed into rate ratios (RRs) with corresponding 95% CIs to aid interpretation.

Univariate and multivariate logistic regression analyses were conducted to compare the hospitality group who have died by suicide and all other occupations group who have died by suicide with respect to sex, age group, marital status, residential SEIFA, and country of birth. Analyses applied logistic regression models with odds ratios (ORs) and 95% CIs for categorical variables. For multivariate analysis, all variables were entered simultaneously into models, with ORs and their 95% CIs reported.

All analyses were undertaken using R Studio [32] with statistical significance established at the 0.05 level.

Results

Descriptive analysis and age-standardised suicide rates

Between 2006 and 2017, there were 11,660 suicides in Australia where the person was employed at the time of death and aged between 16 and 74 years (out of a total 31,086 cases). The overall age-standardised suicide rate (ASR) in hospitality workers over this period was 10.8 (95% CI 9.5–12.0) per 100,000 for males and 3.1 (95% CI 2.5–3.7) per 100,000 for females. The age-standardised suicide rates in all other occupations were 10.7 (95% CI 10.5–10.9) per 100,000 for males and 2.4 (95% CI 2.3–2.6) per 100,000 for females. Hence, there were no significant differences in ASR between male hospitality workers and males in all other occupation, and between female hospitality workers and females in all other occupations. Table 1 describes the number of suicides for males and females in each occupational group, mean age, population, and age-standardised suicide rates. For males, the highest suicide rates were among butchers and smallgoods makers (ASR 16.9, 95% CI 12.1–21.7) and chefs (ASR 14.4, 95% CI 11.7–17.1). For females,

Table 1 Age-standardised rates of suicide by employed adults aged 16–74 years for hospitality occupation groups and for all other occupations, Australia, 2006–2017

	All persons	Males	Females
All other occupations			
Number of suicides	11,243	9371	1872
Mean age (years)	41.2	41.3	40.9
Population ^a	9,612,765	5,153,786	4,458,979
Adjusted suicide rate (95% CI) ^b	6.9 (6.8–7.0)	10.7 (10.5–10.9)	2.4 (2.3–2.6)
Bakers and pastrycooks			
Number of suicides	38	34–37	1–4
Mean age (years)	34.4	34.7	np
Population ^a	24,685	17,369	7316
Adjusted suicide rate (95% CI) ^b	8.7 (5.9–11.4)	11.5 (7.7–15.3)	np
Bar attendants and baristas			
Number of suicides	73	51	22
Mean age (years)	30.2	29.3	32.1
Population ^a	67,812	28,400	39,412
Adjusted suicide rate (95% CI) ^b	7.4 (5.7–9.1)	11.5 (8.3–14.6)	4.6 (2.7–6.6)
Butchers and smallgoods makers			
Number of suicides	48	44–47	1–4
Mean age (years)	37.1	37.1	np
Population ^a	17,625	16,685	940
Adjusted suicide rate (95% CI) ^b	16.4 (11.7–21.0)	16.9 (12.1–21.7)	np
Chefs			
Number of suicides	133	110	23
Mean age (years)	33.5	33.6	33.2
Population ^a	57,538	43,562	13,976
Adjusted suicide rate (95% CI) ^b	13.0 (10.8–15.2)	14.4 (11.7–17.1)	8.8 (5.2–12.4)
Cooks			
Number of suicides	17	11	6
Mean age (years)	34.9	29.8	44.3
Population ^a	46,911	21,896	25,015
Adjusted suicide rate (95% CI) ^b	2.2 (1.1–3.2)	2.4 (1.0–3.8)	1.5 (0.3–2.7)
Waiters			
Number of suicides	35	14	21
Mean age (years)	29.1	30.3	28.2
Population ^a	90,831	20,580	70,251
Adjusted suicide rate (95% CI) ^b	2.6 (1.8–3.5)	5.0 (2.4–7.6)	2.0 (1.1–2.8)
Other hospitality workers^c			
Number of suicides	73	46	27
Mean age (years)	31.5	32.8	29.3
Population ^a	49,800	15,797	34,003
Adjusted suicide rate (95% CI) ^b	8.6 (6.6–10.5)	18.4 (13.1–23.7)	4.2 (2.6–5.8)

Np counts not provided where they are < 5 for confidentiality reasons

^aAustralian Bureau of Statistics 2011 census data

^bAge-standardised rate per 100,000 person-years

^cCafé workers, food trades workers not further defined, gaming workers, hospitality workers not further defined, hotel service managers were aggregated with other hospitality workers due to low incident counts

the highest suicide rates were in chefs (ASR 8.8, 95% CI 5.2–12.4) and bar attendants and baristas (ASR 4.6, 95% CI 2.7–6.6). Population data show that male dominated occupations included butchers and smallgoods makers,

chefs, and bakers and pastrycooks. Female-dominated occupations included waiters, other hospitality workers, and bar attendants and baristas.

Negative binomial analysis predicting suicide rate

The main effects model can be seen in Table 2. After controlling for sex, age, and year of death, chefs (RR 1.57, 95% CI 1.31–1.86), butchers and small goods makers (RR 1.61, 95% CI 1.19–2.11), and other hospitality worker (RR 1.79, 95% CI 1.40–2.23) were shown to have significantly elevated rates of suicide compared to other occupations. Cooks (RR 0.35, 95% CI 0.21–0.55) and waiters (RR 0.58, 95% CI 0.41–0.79) were found to have significantly lower rates of suicide compared to other occupations. These findings also suggest that suicide rates for the employed population were higher for males (RR 4.26, 95% CI 4.03–4.50), and have increased slightly over time (RR 1.01, 95% CI 1.00–1.02). Furthermore, compared to the younger working population (16–29 years), suicide rates were higher among the middle aged (30–59 years) working population.

Table 2 also shows the interaction model. The interaction tests indicated significant differences in the relationship between occupation and suicide by sex ($LRT_{x2(7)} = 22.87, p = 0.002$). Results of the interaction tests examining variation in RRs in the hospitality occupation groupings (with all other occupations as the reference group) by sex (females as the reference group), were significant for chefs only. This significant interaction was further examined with follow-up tests. These follow-up tests showed in terms of RRs, and holding other predictors constant, that: (i) male chefs had 1.38 (95% CI 1.14–1.67) times the suicide rate of males in all other occupations, and (ii) female chefs had 3.93 (95% CI 2.60–5.94) times the suicide rate of females in all other occupations. The follow-up tests also showed in terms of RRs, holding other predictors constant, that: (i) male chefs had 1.53 (95% CI 0.98–2.41) times the suicide rate of female chefs, although this was not significant, and (ii) males in all other occupations had 4.36 (95% CI 4.12–4.61) times the

Table 2 The main effects model and model with interaction terms, rate ratios with 95% confidence intervals comparing suicide rate of hospitality occupation groups and all other occupations, 2006 to 2017

	Main effects model		Interaction model	
	Rate ratio (95% CI)	P	Rate ratio (95% CI)	P
Occupation				
All other occupations (reference)	Reference		Reference	
Bakers and pastrycooks	1.12 (0.80–1.51)	0.502	0.99 (0.25–2.58)	0.991
Bar attendants and baristas	1.17 (0.92–1.47)	0.180	1.45 (0.92–2.15)	0.084
Butchers and smallgoods makers	1.61 (1.19–2.11)	0.001	2.54 (0.14–11.18)	0.352
Chefs	1.57 (1.31–1.86)	<0.001	3.93 (2.53–5.79)	<0.001
Cooks	0.35 (0.21–0.55)	<0.001	0.58 (0.23–1.17)	0.177
Waiters	0.58 (0.41–0.79)	0.001	0.79 (0.50–1.18)	0.285
Other hospitality workers ^b	1.79 (1.40–2.23)	<0.001	1.98 (1.32–2.84)	<0.001
Sex				
Females	Reference		Reference	
Males	4.26 (4.03–4.50)	<0.001	4.36 (4.12–4.61)	<0.001
Age group				
16–29 years	Reference		Reference	
30–44 years	1.32 (1.24–1.41)	<0.001	1.32 (1.24–1.41)	<0.001
45–59 years	1.25 (1.18–1.34)	<0.001	1.25 (1.18–1.34)	<0.001
60–74 years	0.92 (0.84–1.01)	0.070	0.92 (0.84–1.00)	0.062
Year	1.01 (1.00–1.02)	0.001	1.01 (1.00–1.02)	0.001
Occupation × sex (interaction)				
Other occupations × females			Reference	
Bakers and pastrycooks × males			1.13 (0.41–4.69)	0.840
Bar attendants and baristas × males			0.75 (0.46–1.26)	0.255
Butchers and smallgoods makers × males			0.63 (0.14–11.09)	0.643
Chefs × males			0.35 (0.23–0.57)	<0.001
Cooks × males			0.50 (0.19–1.47)	0.178
Waiters × males			0.53 (0.26–1.03)	0.063
Other hospitality workers ^b × males			0.86 (0.53–1.40)	0.523

^aAustralian Bureau of Statistics 2011 census data

^bCafé workers, food trades workers not further defined, gaming workers, hospitality workers not further defined, hotel service managers were aggregated with other hospitality workers due to low incident counts

suicide rate of females in all other occupations. It should also be noted that the significant main effects for butchers and smallgoods makers, cooks, and waiters found previously in the main effects model became non-significant in the interactional model.

Logistic analyses predicting membership of those in hospitality occupations who have died by suicide group

In the univariate analysis (Table 3), demographic characteristics and area-level socio-economic position were predictive of suicide among the combined “hospitality occupations” group compared to all other occupations. Specifically, the hospitality occupations group had significantly greater odds of: being female (OR 0.61, 95% CI 0.49–0.77) being single/never married (OR 2.17, 95% CI 1.72–2.75) or unlikely to be known marital status (OR 1.72, 95% CI 1.25–2.36)

compared to married/de facto, residing in residential SEIFA areas classified as either most disadvantaged (IRSAD quintile 1) (OR 1.60, 95% CI 1.78–2.17) or most advantaged (IRSAD quintile 5) (OR 1.39, 95% CI 1.01–1.91) compared to middle SEIFA areas (IRSAD quintile 3), and being born outside of Australia (OR 1.40, 95% CI 1.01–1.79) compared to being born in Australia. Those aged 30–44 years (OR 0.38, 95% CI 0.31–0.47), 45–59 years (OR 0.17, 95% CI 0.16–0.23), and 60–74 years (OR 0.19, 95% CI 0.11–0.33) had lower odds of being in the hospitality occupations group compared to those aged 16–29 years.

Multivariate logistic analysis predicting membership of those in hospitality occupations who have died by suicide group

In the multivariate analysis (Table 3), the hospitality occupations group had significantly greater odds of: being female

Table 3 Univariate and multivariate logistic analysis of all hospitality occupations relative to all other occupations

	A. Hospitality occupations ^a (N=417) %	B. All other occupations (N=11,243) %	A vs B (reference) Univariate model Odds ratio (95% CI)	P	A vs B (reference) Multivariate model Odds ratio (95% CI)	P
Sex						
Male	75.3	83.3	0.61 (0.49–0.77)	<0.001	0.63 (0.50–0.79)	<0.001
Female	24.7	16.7	Reference			
Age group						
16–29 years	48.7	20.6	Reference			
30–44 years	34.5	38.4	0.38 (0.31–0.47)	<0.001	0.40 (0.32–0.51)	<0.001
45–59 years	13.4	33.6	0.17 (0.16–0.23)	<0.001	0.18 (0.13–0.24)	<0.001
60–74 years	3.4	7.4	0.19 (0.11–0.33)	<0.001	0.20 (0.11–0.35)	<0.001
Marital status						
Married/de facto	30.5	41.0	Reference			
Single/never married	39.1	24.2	2.17 (1.72–2.75)	<0.001	1.20 (0.92–1.56)	0.186
Divorced/separated	16.3	23.2	0.95 (0.70–1.28)	0.714	1.04 (0.77–1.40)	0.812
Widowed	0.5	1.0	0.67 (0.16–2.72)	0.571	0.89 (0.21–3.73)	0.877
Unlikely to be known	13.7	10.7	1.72 (1.25–2.36)	0.001	1.24 (0.88–1.73)	0.220
SEIFA (National IRSAD quintile)						
Most advantaged (5)	20.4	18.4	1.39 (1.01–1.91)	0.041	1.34 (0.98–1.85)	0.071
Second most advantaged (4)	18.0	18.6	1.21 (0.88–1.68)	0.243	1.16 (0.84–1.62)	0.366
Middle (3)	18.0	22.5	Reference			
Second most disadvantaged (2)	18.7	21.2	1.11 (0.80–1.53)	0.538	1.17 (0.84–1.62)	0.351
Most disadvantaged (1)	23.7	18.6	1.60 (1.78–2.17)	0.003	1.62 (1.19–2.20)	0.002
No SEIFA	1.2	0.7	2.01 (0.79–5.10)	0.142	1.53 (0.59–3.98)	0.387
Birth country						
Australia	56.8	60.0	Reference			
Other than Australia	21.6	16.3	1.40 (1.09–1.79)	0.008	1.74 (1.34–2.25)	<0.001
Unlikely to be known	21.6	23.8	0.96 (0.45–1.23)	0.734	1.42 (0.83–1.42)	0.537

SEIFA socio-economic indexes for areas, IRSAD index of relative socio-economic advantage and disadvantage

^aBakers and pastry cooks, bar attendants and baristas, butchers and smallgoods makers, café workers, chefs, cooks, food trades workers not further defined, gaming workers, hospitality workers not further defined, hotel service managers, other hospitality workers, waiters

(OR 0.63, 95% CI 0.50–0.79), reside in residential SEIFA areas classified as most disadvantaged (IRSAD quintile 1) (OR 1.62, 95% CI 1.19–2.20) compared to middle SEIFA areas (IRSAD quintile 3), and being born outside of Australia (OR 1.74, 95% CI 1.36–2.25) compared to being born in Australia. Those aged 30–44 years (OR 0.40, 95% CI 0.32–0.51), 45–59 years (OR 0.18, 95% CI 0.13–0.24), and 60–74 years (OR 0.21, 95% CI 0.11–0.35), had lower odds of being in the hospitality occupations group compared to those aged 16–29 years.

Discussion

By investigating suicide rates in the Australian hospitality industry, this is the first study to provide evidence of the risk for suicide among this workforce. Overall, the findings showed that the age-standardised rates for suicide among males and females in hospitality occupations at time of death were not significantly different from the general employed population in Australia, suggesting that the hospitality sector does not collectively carry a great suicide risk relative to other employment types.

Investigation into specific hospitality occupation types, however, showed that employment as a chef was associated with an elevated risk of suicide relative to all other occupations (e.g., male chef suicide rate 1.4 times that of males in all other occupations and female chef suicide rate 3.9 times that of females in all other occupations). In contrast, employment as a cook was associated with decreased risk of suicide relative to all other occupations in the main effects model, however, this result was non-significant in the interaction model. Whilst both chefs and cooks share an environment which is both physically and psychologically stressful, chefs require additional knowledge, skills, and abilities to maintain the operational success of restaurants [33]. It is possible that the additional pressures associated of being a chef, opposed to a cook, may play a role in explaining the high rate of suicide among chefs. However, it is also possible that our sample, which contains very few persons employed as cooks, is insufficiently heterogeneous. Regardless, the potentially buffering effect associated with employment as a cook compared to chefs should be further examined.

There also appeared to be some additional gender-specific effects between hospitality occupations, whereby males employed as butchers and smallgoods makers should be considered as high risk, as should females working as bar attendants and baristas (ranked in the top two for female hospitality occupations with highest ASR). These findings are consistent with the only other two prior studies in this area which were conducted in England and Wales [6, 7], suggesting that these employment types carry an occupational risk for suicide that extends beyond

local settings or conditions. Male-dominated industries have been previously linked to higher suicide rates, with research showing that males in heavily male-dominated occupations are most at risk [34]. While this study did not examine the gendered context of hospitality suicide, varying hospitality occupation risks for males and females suggest a need for nuanced examination of the mechanisms through which gendered working environments influence suicide in hospitality.

Our examination of the relationship between occupation type and risk factors showed that age may be of importance when trying to identify workforce suicide prevention targets, with young people more likely to die by suicide in hospitality than other occupations, compared to older individuals. This finding is consistent with past research in which older workers had significantly lower risk of suicide compared to younger workers [35]. It is possible that hospitality workers aged 30–74 years were less susceptible to risk factors related to hospitality employment. Given that approximately 43% of the Australian hospitality workforce are aged between 15 and 24 years, compared to 15.4% for the total employed population [36], interventions targeted to, and developed for, younger hospitality employees may an important target for workplace suicide prevention efforts.

Being born overseas was also identified as a significant risk factor for suicide among hospitality workers. Overseas-born employees comprise approximately 39% of the Australian accommodation and food services industry according to the 2016 Australian Census data [24]. It has been argued that the number of roles available and low-skill requirements for hospitality make this a ‘refuge’ industry for migrant jobseekers [37, 38]. Research that has explored employers’ willingness to offer jobs to migrant workers found that migrants are perceived as being more willing to accept difficult employment conditions and receive lower pay than the local (native) workforce [39, 40]. While there is limited evidence regarding suicide among migrant workers in Australia [41], these poor employment conditions could feasibly contribute to an already vulnerable population [42]. For example, low socio-economic status has been found to increase suicide risk among male migrants from the UK, New Zealand, and Asia residing in urban New South Wales [43], suggesting that low pay and affordability of living (or ‘economic deprivation’) may be a mechanism underlying suicidal behaviour in male migrant hospitality employees. Previous studies of welfare support and suicide indicate that countries with more generous welfare payments and active labour market programs experience little or increase in suicide during economic downturns [44]. Modification of welfare support policies may be an important component of workplace suicide prevention efforts to better support migrant workers facing economic insecurity [45].

Limitations

While these findings provide useful information on suicide risk among those employed in hospitality occupations, some limitations should be noted. First, it is possible that the rates of suicide reported in this study are higher given probable under-reporting and subsequent miscoding of suicide as other causes of death (e.g., undetermined or accidental) by coroners in Australia, as with any authoritative record of deaths [46]. Second, this study only included persons who were determined by the investigating coroner to be employed with a known occupation at the time of death, it is possible that employed persons who had stopped working due to illness, had retired, or were recently unemployed were not included in this analysis. Additionally, it is possible that occupation may have been miscoded during the coding process, despite matched coding by at least two researchers. Third, we did not have sufficient data to analysis rates within café workers, food trades workers not further defined, gaming workers, hospitality workers not further defined, and hospital service managers. It is possible that persons working in these occupations may be at increased risk of suicide. Fourth, mortality rates based on small numbers may be unreliable and should be interpreted with caution. For example, age-standardised rates for female cooks were calculated using a count of six suicide deaths over the 12-year period. Finally, the reference category “other occupations” for suicide rate comparisons contained occupations which have been identified to have an elevated suicide risk compared to the general employed population (e.g., farming and agriculture workers, veterinarians, doctors, nurses and midwives) [10], which may have reduced the calculated incidence rate ratios when comparing suicide rates between hospitality groups and other occupations.

Conclusion

Overall, the current research provides new insights for suicide risk and the specific factors which play a notable role in contributing to suicide deaths among hospitality workers in Australia. Importantly, factors such as migrant status and age appeared to uniquely differentiate suicide deaths among hospitality workers from those in the general employed population. The hospitality industry is one of the preferred sources of employment for young Australians and new Australian migrants, however, the adverse working conditions and low pay characteristic of hospitality may place vulnerable workers at risk of poor mental health and subsequent suicidality. Though it is clear that more research is needed to fully understand occupational risk and employment characteristics, future initiatives could adopt an industry wide approach to identifying and managing work-related stressors

(e.g., reasonable working hours, zero tolerance to workplace bullying, social support, improved working conditions), supporting the mental health and wellbeing of young and migrant workers in particular, and ensuring access to mental health support (e.g., through employee-assistance programs).

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical standards This study was approved by the Department of Justice and Community Safety Human Research Ethics Committee (CF/19/30711).

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