Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Original Article

Predictors of vaccine hesitancy among disability support workers in Australia: A cross-sectional survey

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ABSTRACT

Background: Achieving high levels of vaccination among disability support workers (DSWs) is critical to protecting people with disability from COVID-19 and other vaccine-preventable diseases.
Objective: To identify how demographic factors, risk perceptions of COVID-19 and the COVID-19 vaccine, and views about COVID-19 vaccination are associated with COVID-19 vaccine hesitancy among DSWs.
Methods: Survey of 252 Australian DSWs conducted in March and early April 2021. Participants were classified as vaccine hesitant if they had not been vaccinated and would not have the vaccine when offered it. Logistic regression analysis was used to control for confounders.
Results: 52.4% of DSWs were hesitant with females being more likely to be hesitant than males (58.2% female, 38.1% male). Hesitancy was more frequent among DSWs who were not worried about COVID-19 for themselves or their family (adjusted odds ratio (AOR) 1.86, 95% CI 1.0–3.45); did not agree they were at more risk than the rest of the community (AOR 2.29, 95% 1.25–4.20); were concerned about vaccine safety (AOR 22.86, 95% CI 10.59–49.13) and were not confident the vaccine would protect them (AOR 6.06, 95% CI 3.21–11.41) or the clients from COVID-19 (AOR 6.03, 95% CI 3.19–11.41). DSWs who thought vaccination was a personal choice were more likely to be hesitant (82.1%) than those who thought it was a community responsibility (27.6%).
Conclusions: The study shows that increasing vaccination rates among DSWs requires targeted strategies that emphasise the seriousness of the infection; the potential for vaccines to reduce transmission; and vaccine safety and efficacy.

People with disability who require paid support may be at greater risk of contracting COVID-19 because they are in contact with disability support workers (DSWs) who are likely to support other people with disability in a variety of different settings including private homes, disability residential settings, and the community.[1] Many people with disability have underlying health conditions that put them at risk of serious disease or death if they become infected with SARS-CoV-2.[2] International studies have reported higher rates of COVID-19 infection among people with disability, particularly those living in congregate settings.[3–5] Mortality rates are also higher among people with disability,[6] particularly those with intellectual disability.[4,7] In England, nearly 60% of all deaths have occurred among people with disability.[6]

People with disability, disability support workers and COVID-19 in Australia

As of May 27, 2022, 8432 Australians had died of COVID-19 with 6193 deaths in 2022, 1330 in 2021, and 909 in 2020.[8] However, Australia does not have accurate data on the number of infections and deaths among Australians with disability or DSWs.

The course of the COVID-19 pandemic has varied across Australian states and territories. In March and April 2020 Australia experienced its first wave of COVID-19, largely driven by returned travellers. Between June and October 2020, the state of Victoria experienced a second wave of COVID-19, and the third wave of the pandemic began in June 2021 in NSW and then Victoria and the Australian Capital Territory.

At the time of writing, Australia was experiencing high levels of infections. Outbreaks in disability residential settings have

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occurred throughout the pandemic however these numbers have not been reported routinely, details of COVID-19 infections and deaths are occasionally released to journalists or in media releases.

In recognition of the risks to people with disability of COVID-19 infection, the Commonwealth government of Australia established a COVID-19 Management and Operational Plan (The Plan) launched in April 2020 and September 2020. The Plan specified the risks for people with disability from SARS-CoV-2 and strategies to mitigate them such as hygiene, accessible information, use of masks, physical distancing, and outbreak control.[9]

The Plan recognised that interventions to reduce risk of spread among people with disability needed to target DSWs as they were at significant risk of transmitting infection due to contact with multiple people with disability over the course of their work (median of 5 people, range 0–50 over a week).[10] However, surveys and qualitative interviews with DSWs have shown that they felt 'left behind' by governments with a lack of information, training, and personal protective equipment to protect them during COVID-19 and little guidance on how to manage outbreaks in residential settings, such as group homes, where people with disability live.[10–12] These findings are consistent with the outcomes of a special hearing of the Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability.[13]

Rollout of COVID-19 vaccines in Australia

Australia had limited vaccine supply between early and mid 2021 and prioritised specific population groups of people for vaccination. This included individuals who were at risk of poor outcomes (clinically vulnerable) if they became infected (e.g., people living in residential aged care), who were at high risk of exposure (e.g., border force workers), and/or who provided support to people who were clinically vulnerable, such as health care workers. People with disability living in residential settings with two or more people with disability and the DSWs that supported residents in those settings were among the nearly 700,000 Australians in the highest priority group for vaccination. People with disability with underlying conditions and DSWs working in the community were in the next priority group.[14] These groups were meant to have been vaccinated by April 2021 however rollout of the vaccine to these groups was significantly delayed due to logistical issues and the government's decision to deprioritise people with disability in residential settings.[15]

In early April 2021 the Australian government restricted access to the AstraZeneca vaccine to people older than 50 years (and in June 2021 older than 60 years) due to reports of Thrombosis with Thrombocytopenia syndrome.[16] In April 2021, there were relatively high levels of vaccine hesitancy among Australians with only 55% of the adult population indicating that they would definitely be vaccinated.[17]

Despite the high levels of hesitancy reported in April 2021, by May 27, 2022 over 95% of Australians aged 16 years and older had received two or more doses of one of the approved vaccines and nearly 70% of those eligible had three doses of a COVID-19 vaccine.[18]

Vaccination among DSWs

In March and early April 2021 we conducted a survey of DSWs to ascertain their vaccine intentions and level of hesitancy,[19] where hesitancy was defined as the delay in acceptance and refusal of vaccines.[20] The survey was conducted at a time of no to minimal community transmission, only a small proportion of the population had been vaccinated, there were high levels of hesitancy in the community,[17] and when concerns about AstraZeneca vaccine were emerging. We found that only 47% of DSWs would definitely get vaccinated. Reasons why DSWs were hesitant included concerns about side effects and safety and efficacy of the vaccine, with over half of those delaying vaccination indicating they were waiting to see how the vaccine affected others. At that time, only 43% of participants agreed that COVID-19 vaccination should be compulsory for DSWs; 20% said they would not continue to work as DSWs if it was made mandatory.[19]

From mid 2021 Australian states and territories mandated vaccination among disability support workers with all workers requiring two vaccines by the end of 2021. It is not known how many DSWs left the workforce because of the mandate.

Our study described the level of hesitancy and potential reasons for hesitancy, however we did not examine the predictors of hesitancy and potential ways to target messaging to this workforce. Reviews of studies examining vaccine hesitancy among health care workers across the world have found that being male, older age, having confidence in the safety and efficacy of COVID-19 vaccines, having direct contact with COVID patients, and having higher perceived risk and fear of COVID-19 were associated with lower levels of COVID-19 vaccine hesitancy.[21,22] A study in Ontario, Canada among workers supporting adults with intellectual disability found that being older, male, having concerns about themselves or clients becoming ill and belief that the vaccine will protect their family and clients from becoming ill were associated with intentions to be vaccinated. Concerns about side effects, lack of trust in vaccine, and belief that was not necessary because in good health were associated with workers reporting they were less likely to get vaccinated.[23]

Vaccines are likely to be the cornerstone of measures to reduce the risks of COVID-19 now and in the foreseeable future. This will include boosters, new vaccines and potentially using new technologies, all of which will likely raise similar concerns as the initial COVID-19 vaccines. Achieving high vaccine-induced immunity against COVID-19 and influenza will be important for protecting people with disability now and in the future. Furthermore, governments around the world have dropped many COVID-19 mitigation strategies (e.g., masks) and it is possible that occupational vaccine mandates will be dropped in the future. Therefore, it continues to be important to understand what drives vaccine hesitancy in this workforce so that communications can be appropriately targeted to maintain high levels of vaccination.

In this study, we extend our previous analyses of our survey of 252 DSWs collected between early March and early April 2021 with the aim of describing associations between demographic variables; state of residence (to explore the impact of different experiences of the pandemic across Australia); whether or not DSWs worked in disability residential settings; perceptions of risk of COVID-19 including risks related to work; government responses to COVID-19; media portrayals of the seriousness of COVID-19; confidence in the COVID-19 vaccine; and views about whether COVID-19 vaccination is a personal choice or community responsibility and vaccine hesitancy.

Methods

Participants and design

A total of 252 DSWs were recruited through disability services, unions, and social media, Australia-wide, between 5 March and April 8, 2021. Eligibility criteria for participation in the study included working as a Disability Support Worker in Australia and aged 18 years or older. Participants opted-in to completing an online survey which was in English and administered via the RedCap platform. Ethical approval was received from The University of

Melbourne Human Ethics Committee (HREC: 2056824). Most questions were derived from previous surveys[24,25] with some questions designed for this survey (e.g., perceptions of risk of COVID-19 for DSWs).

Variables

Outcome

Participants were asked if they had the COVID-19 vaccine. If they had not, they were asked "when the vaccine becomes available to you, do you think you will … ?": 1. get the vaccine as soon as I can, 2. wait until it is has been available a while; 3. only get the vaccine if you are required to for work or other activities; 4. haven't decided if I will get the vaccine or not; or, 5. will not get the vaccine. Participants who chose responses 2–5 were classified as vaccine hesitant and those who answered 1 to this question or had been vaccinated were classified as non-hesitant.

Covariates

Demographic variables. Information was collected about age, gender (male, female, non-binary), country of birth (Australia or other English-speaking country, other); First Nations status (Aboriginal and/or Torres Strait Islander, not Aboriginal or Torres Strait Islander) and place of residence (Victoria, not Victoria). Participants were asked if they had worked in a group home in the previous week and were classified as being in Phase 1a if they answered yes and Phase 1b if they answered no.

Perceptions of risk of COVID-19. Questions regarding the risk of contracting and transmitting COVID-19 associated with being a DSW were ascertained by asking them to think back to 2020 before vaccines were available, the extent that they agreed or disagreed with three statements (response options: strongly agree, agree, neither agree or disagree, disagree, strongly disagree): 1. 'DSWs are more at risk of getting COVID than people in the community'; 2. 'The risk to DSWs is greater if they work in group homes compared to DSWs in private homes'; 3. If DSWs get infected, then there is a high likelihood that they will infect others if they go to work'. These were recoded as: agree (strongly agree and agree) and do not agree (neither agree or disagree, disagree and strongly disagree).

To ascertain the extent that DSWs were concerned about contracting COVID-19, participants were asked 'How worried, if at all, are you that you or someone in your family will get sick from COVID-19?' with response options: very worried, somewhat worried, not too worried, not at all worried, not applicable and don't know. Responses were reclassified as worried (very worried and somewhat worried), not worried (not too worried and not at all worried), and missing (not applicable and don't know).

In terms of perception of governments' responses, DSWs were asked: In an effort to slow the spread of COVID-19, do you think your State or Territory has had: 1. too many restrictions; 2. not enough restrictions; or 3. the right amount of restrictions? This was reclassified as about right/not enough and too many. To assess perceptions about the media portrayal of COVID-19, we asked 'Thinking about what is said in the news and on social media, in your view, is the seriousness of COVID-19: 1. generally exaggerated, 2. generally correct; 3. generally underestimated. This variable was reclassified as generally correct/underestimated and overestimated.

Perceptions of the safety and efficacy of the COVID-19 vaccine. Participants were asked the extent that they agreed or disagreed with 10 statements that assessed their perceptions of the safety (2 questions) and efficacy of COVID-19 vaccination in preventing COVID-19 for themselves, their clients, and the community (6 questions) as well as their need for information (1 question) and whether their vaccination intention was influenced by whether the vaccination was taken by many in the community (1 question). Response options were: strongly agree, agree, neither agree or disagree, disagree and strongly disagree; these were reclassified as agree (strongly agree and agree) and do not agree (neither agree or disagree, disagree and strongly disagree).

Opinions about COVID-19 vaccines. DSWs were asked whether personal choice or community responsibility should influence decisions about vaccination, and whether they supported compulsory vaccination of DSWs.

Statistical analysis

Analyses were undertaken in Stata 16.[26] Frequency of responses according to different covariates are reported as proportions with 95% confidence intervals. Logistic regression analysis was used to examine the associations between demographic variables, perceptions of risk of COVID-19, government responses to COVID-19, media portrayals of COVID-19, perceptions and opinions about COVID-19 vaccines and vaccine hesitancy. To control for potential confounding all models were adjusted for demographic variables (age, country of birth, First Nations status, gender). Separate models were run for each exposure of interest (e.g., worried about themselves or their family) and association with the outcome (vaccine hesitancy), controlling for the confounders outlined above.

Missing data ranged from < 1% to 3% for all variables, with the exception of age (11%) and country of birth (6%). Fig. 1 shows the flowchart for the analytic sample. 255 DSW completed the survey of whom 252 were currently working as DSWs. After excluding participants who did not answer questions on vaccine hesitancy or who were missing information on age, country of birth, First Nation status, and gender, there were 199 in the analytic sample.

Sensitivity analysis

We replicated the logistic regression analyses described above restricting the analysis to participants from the state of Victoria (n = 203), as they constituted the majority of the study sample and given Victoria had experienced extensive lockdowns, the associations may be different for Victoria than other states. We controlled for age, country of birth, and gender in these analyses. First Nations status was excluded from these models due to very small numbers.

Results

Table 1 shows the demographic characteristics of the sample. 55.4% of the sample were over 50 years of age, 72.7% were female, 80.6% were Victorian and 66.0% qualified in Phase 1a of the vaccine rollout.

Demographic predictors of vaccine hesitancy (Table 2)

Female gender was associated with higher levels of hesitancy (58.2% female, 38.1% male; adjusted odds ratio (AOR) 2.06, 95% CI 1.07–3.94). There was no evidence any other demographic variables were associated with hesitancy including whether they were Victorian or in Phase 1a or 1b of the vaccine rollout.

Perceptions of risk of COVID-19 (Table 3)

Vaccine hesitancy was more common among participants who did not agree that DSWs were more likely to get COVID-19 than the rest of the community (did not agree 65.1%, agree 37.3%; AOR 2.29

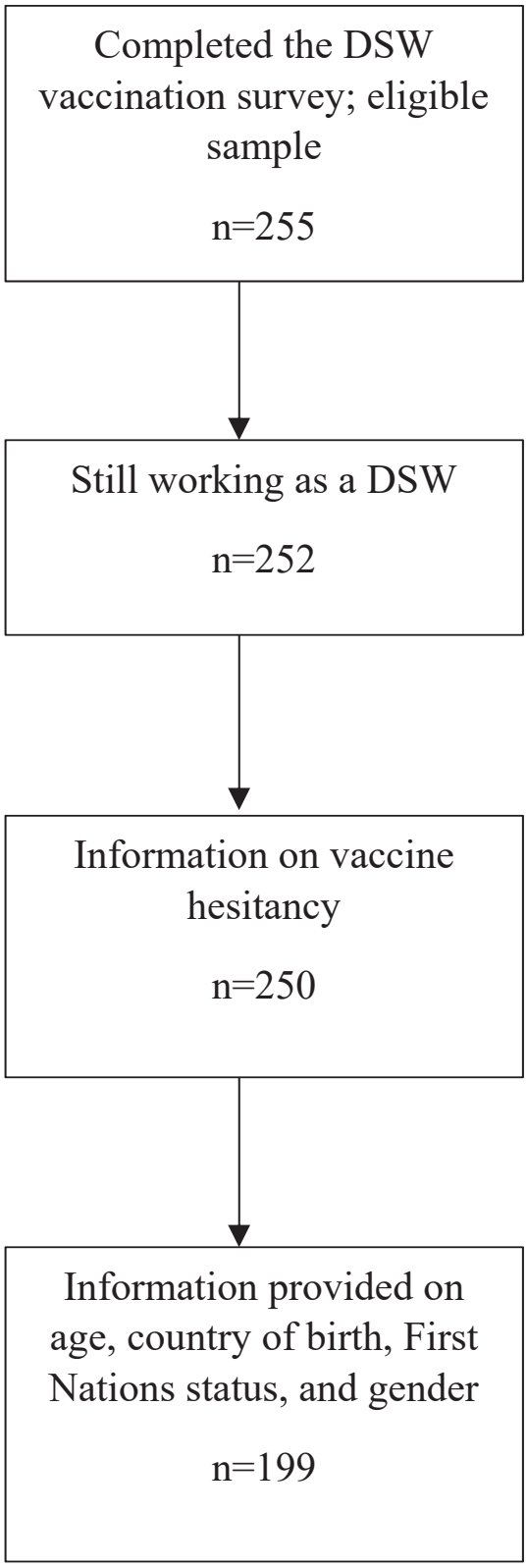

Fig. 1. Flow chart.

95% CI 1.25–4.20) and that if DSWs got infected that they had a high likelihood of infecting others if they went to work (do not agree 62.3%, agree 40.7%; AOR 1.77 95% CI 0.98–3.19). Worry about themselves or family becoming infected was also associated with hesitancy (not worried 60.4%, worried 44.6% AOR 1.86 95% CI 1.00–3.45).

Hesitancy was strongly associated with perceiving that there were too many restrictions (too many 79.7%, about right/not enough 44.2% AOR 7.15 95% CI 2.90–17.62) and that media exaggerated the seriousness of COVID-19 (90.7% exaggerated, 40.8% correct/underestimated AOR 19.42 95% CI 5.63–66.98).

Table 1
Descriptive characteristics of the sample (n = 252).

	n	%
Age		
18–29	26	11.7
30–49	73	32.9
50–64	109	49.1
65+	14	6.3
Country of Birth		
English speaking	200	84.7
Non-English speaking	36	15.3
First Nations status		
Aboriginal and/or Torres Strait Islander	5	2.0
Not Aboriginal or Torres Strait Islander	239	98.0
Gender		
Female	178	72.7
Male	64	26.1
Other	3	1.2
State of residence		
NSW	11	4.4
ACT	3	1.2
Vic	203	80.6
Qld	11	4.4
SA	3	1.2
WA	20	7.9
Tas	1	0.4
State (binary)		
Vic	203	80.6
Other	49	19.4
Phase of vaccine rollout		
1a (worked in one or more group home in last week)	161	66.0
1b (did not work in any group home in the last week)	83	34.0

Perceptions of safety and efficacy of vaccine (Table 4)

Concerns about safety of the COVID-19 vaccine was associated with hesitancy, with 83% of workers who did not agree with the statement 'once the vaccine is available and approved, I know it is safe' being hesitant compared with 17.8% of those who agreed with the statement (AOR 22.86, 95% CI 10.59–49.31).

Hesitancy was also strongly related to whether participants agreed with statements relating to the efficacy of the vaccine in terms of preventing themselves and their clients from becoming infected and in preventing COVID-19 spreading in the community. For example, 75.6% of DSWs who did not agree with the statement 'my chances of getting COVID-19 will decrease after I have the vaccine' were hesitant compared to 30.2% among those who did agree (AOR 6.06, 95% CI 3.21–11.41); 75.9% of participants who did not agree with the statement 'the clients are less likely to get COVID-19' were hesitant compared to 31.3% who agreed with this statement (AOR 6.03, 95% CI 3.19–11.41); and, 85.1% of those who did not agree with the statement 'the vaccine is the best way to stop the COVID-19 pandemic' were hesitant compared to 28.4% of those that did agree (AOR 14.94, 95% CI 7.00–31.85).

63.8% of participants who agreed with the statement 'I will only have the COVID vaccine if the vaccine is taken by many in the community' were hesitant compared with 48.4% of those who did not agree (AOR 0.43, 95% CI 0.21–0.86). There was no statistical evidence that the need for adequate information about the vaccine was associated with hesitancy.

Table 2
Logistic regression analysis of demographic variables, state of residence and phase of rollout and predictors of hesitancy, unadjusted and adjusted odd ratios (OR) and 95% confidence interval (95% CI).

	Hesitators (n, %)		Unadjusted OR	95% CI	Adjusted OR*	95% CI
	Yes	No				
Age						
<50 years	48 (49.0)	50 (51.0)	ref		ref	
≥50 years	63 (51.6)	59 (48.4)	1.11	0.65, 1.89	0.92	0.51, 1.64
Country of birth						
English speaking	100 (50.3)	99 (49.8)	ref		ref	
Non-English speaking	19 (54.3)	16 (45.7)	1.18	0.57, 2.42	1.35	0.59, 3.09
First Nations status						
Not Aboriginal or Torres Strait Islander	122 (51.5)	115 (48.5)	ref		ref	
Aboriginal or Torres Strait Islander	2 (40.0)	6 (60.0)	0.63	0.10, 3.83	0.75	0.12, 4.73
Gender						
Male	24 (38.1)	39 (61.9)	ref		ref	
Female	103 (58.2)	74 (41.8)	2.26	1.25, 4.08	2.06	1.07, 3.94
Other	1 (33.3)	2 (66.7)	–	–	–	–
Phase of rollout						
1a (worked in one or more group home in last week)	80 (50.0)	80 (50.0)	ref		ref	
1b (did not work in any group home in the last week)	45 (54.9)	37 (45.1)	1.22	0.71, 2.08	1.25	0.68, 2.29
State						
Victoria	103 (51.2)	98 (48.8)	ref		ref	
Elsewhere in Australia	28 (57.1)	21 (42.9)	1.27	0.68, 2.38	1.27	0.62, 2.63

*adjusted for age, country of birth, gender, First Nations status.

Opinions about the vaccine (Table 4)

Participants who saw COVID-19 vaccination as a personal choice were more likely to be hesitant (82.1%), than those who saw it as a community responsibility (27.6%) (AOR 9.90, 95% CI 4.96–19.77). Those who did not support or were undecided as to whether the vaccine should be compulsory for DSWs were more likely to be hesitant (78.7%) than those who supported compulsory vaccination (18.4%) (AOR 15.99, 95% CI 7.76–32.93).

Sensitivity analyses (Supplementary Tables 1-3)

Results of all sensitivity analyses restricting the sample to DSWs in Victoria were very similar to the main analyses presented in Tables 2–4 albeit with wider confidence intervals reflecting the reduced sample size.

Discussion

Main findings

This is one of the few studies we know of that has assessed the predictors of vaccine hesitancy among DSWs and is therefore of Australian and international significance. In terms of occupational risks, DSWs who did not consider themselves to be at higher risk of COVID-19 infection or that vaccines were unlikely to protect them or people with disability they support were more likely to be hesitant. Female gender and not being worried about COVID-19 infection for themselves or their family members was also associated with more hesitancy.

Participants who did not agree with the statement that they would have the vaccine if the rest of the community did were less likely to be hesitant. DSWs who considered COVID-19 vaccination

Table 3
Logistic regression analysis of associations between perceptions of risk of COVID, government responses to COVID-19 and media portrayals of COVID-19 and COVID-19 vaccine hesitancy, unadjusted and adjusted odd ratios (OR) and 95% confidence interval (95% CI).

	Hesitators (n, %)		Unadjusted OR	95% CI	Adjusted OR*	95% CI
	Yes	No				
Worried about themselves or family						
Very worried, somewhat worried	58 (44.6)	72 (55.4)	ref		ref	
Not worried, not at all worried	64 (60.4)	42 (39.6)	1.89	1.12, 3.18	1.86	1.00, 3.45
Occupational risk of COVID-19						
DSWs are more at risk of getting COVID than people in the community						
Yes	44 (37.3)	74 (62.7)	ref		ref	
No	82 (65.1)	44 (34.9)	3.13	1.86, 5.29	2.29	1.25, 4.20
The risk to DSWs is greater if they work in group homes compared to DSWs in private homes						
Yes	51 (45.5)	61 (54.5)	ref		ref	
No	68 (58.1)	49 (41.9)	1.66	0.98, 2.80	1.58	0.86, 2.90
If DSWs get infected, then there is a high likelihood that they will infect others if they go to work						
Yes	48 (40.7)	70 (59.3)	ref		ref	
No	76 (62.3)	46 (37.7)	2.41	1.43, 4.05	1.77	0.98, 3.19
Government response (restrictions)						
About the right amount/not enough	84 (44.2)	106 (55.8)	ref		ref	
Too many restrictions	47 (79.7)	12 (20.3)	4.94	2.47, 9.91	7.15	2.90, 17.62
Media portrayal of seriousness of COVID-19						
Generally correct or underestimated	78 (40.8)	113 (59.2)	ref		ref	
Generally exaggerated	49 (90.7)	5 (9.3)	14.20	5.41, 37.24	19.42	5.63, 66.98

*adjusted for age, country of birth, gender, First Nations status.

Table 4
Logistic regression analysis of associations between perceptions of safety and efficacy of COVID-19 vaccine, need for information and opinions about COVID-19 vaccine and COVID-19 vaccine hesitancy, unadjusted and adjusted odd ratios (OR) and 95% confidence interval (95% CI).

	Hesitators (%)		Unadjusted OR	95% CI	Adjusted OR*	95% CI
	Yes	No				
Safety of COVID-19 vaccine						
Once the vaccine is available and approved, I know it's safe						
Agree/strongly agree	21 (17.8)	97 (82.2)	ref		ref	
Neither, disagree/strongly disagree	110 (83.3)	22 (16.7)	23.10	11.97, 44.57	22.86	10.59, 49.31
I am concerned about the safety of the COVID vaccine						
Agree/strongly agree	109 (71.7)	43 (28.3)	ref		ref	
Neither, disagree/strongly disagree	22 (22.7)	75 (77.3)	0.12	0.06, 0.21	0.11	0.06, 0.22
Efficacy of COVID-19 vaccine						
The vaccine will only stop COVID-19 if most of the community is vaccinated						
Agree/strongly agree	45 (29.6)	107 (70.4)	ref		ref	
Neither, disagree/strongly disagree	85 (88.5)	11 (11.5)	18.37	8.96, 37.68	21.78	9.10, 52.10
The best way to avoid complications of COVID-19 is by being vaccinated						
Agree/strongly agree	28 (21.7)	101 (78.3)	ref		ref	
Neither, disagree/strongly disagree	103 (85.8)	17 (14.2)	21.86	11.27, 42.38	21.26	9.77, 46.26
I will be less worried about catching COVID-19 if I have the vaccine						
Agree/strongly agree	34 (25.6)	99 (74.4)	ref		ref	
Neither, disagree/strongly disagree	97 (83.6)	19 (16.4)	14.87	7.94, 27.84	11.91	5.89, 24.09
My chances of getting COVID-19 will decrease after I have the vaccine						
Agree/strongly agree	38 (30.2)	88 (69.8)	ref		ref	
Neither, disagree/strongly disagree	93 (75.6)	30 (24.4)	7.18	4.10, 12.57	6.06	3.21, 11.41
The clients are less likely to get COVID if I have had the vaccine						
Agree/strongly agree	41 (31.3)	90 (68.7)	ref		ref	
Neither, disagree/strongly disagree	88 (75.9)	28 (24.1)	6.90	3.93, 12.12	6.03	3.19, 11.41
I am concerned about how well the COVID vaccine will work						
Agree/strongly agree	99 (66.4)	50 (33.6)	ref		ref	
Neither, disagree/strongly disagree	30 (30.6)	68 (69.4)	0.22	0.13, 0.39	0.22	0.12, 0.41
The vaccine is the best way to stop the COVID-19 pandemic						
Agree/strongly agree	40 (28.4)	101 (71.6)	ref		ref	
Neither, disagree/strongly disagree	91 (85.1)	16 (15.0)	14.36	7.53, 27.38	14.94	7.00, 31.85
Information on vaccine						
I will only have the COVID vaccine if I am given adequate information about it						
Agree/strongly agree	67 (52.8)	60 (47.2)	ref		ref	
Neither, disagree/strongly disagree	63 (52.5)	57 (47.5)	0.99	0.60, 1.63	0.59	0.33, 1.06
Have if rest of community have						
I will only have the COVID vaccine if the vaccine is taken by many in the community						
Agree/strongly agree	37 (63.8)	21 (36.2)	ref		ref	
Neither, disagree/strongly disagree	90 (48.4)	96 (51.6)	0.53	0.29, 0.98	0.43	0.21, 0.86
Opinions about the vaccine						
View that vaccine is community responsibility or personal choice						
Community responsibility	37 (27.6)	97 (72.4)	ref		ref	
Personal choice	92 (82.1)	20 (17.9)	12.06	6.53, 22.29	9.90	4.96, 19.77
Support vaccine being made compulsory						
Yes	20 (18.4)	89 (81.7)	ref		ref	
No, undecided	111 (78.7)	30 (21.3)	16.47	8.76, 30.94	15.99	7.76, 32.93

*adjusted for age, country of birth, gender, First Nations status.

as a personal choice rather than a community responsibility and who did not agree vaccination should be compulsory for DSWs were much more likely to be hesitant, as were DSWs who thought the government's response was too restrictive and that the media exaggerated the seriousness of COVID-19. Interestingly we did not find evidence of an associated between living in Victoria, which had the second wave of COVID-19 with an extended lockdown, and vaccine hesitancy.

Our participants had higher levels of vaccine hesitancy than international studies of health care workers and a Canadian study of disability support workers, although the questions were slightly differently worded.[23,27] These higher levels of hesitancy in Australian disability workers may relate to the fact that at the time of our study Australia had not had high levels of COVID-19 morbidity and mortality and there had been significant delays in the vaccine rollout. On the whole, predictors of hesitancy among DSWs were similar to studies of the general population, health care workers and disability support workers, particular perceptions of the safety and efficacy of COVID-19 vaccination being extremely strong predictors of hesitancy.[21–23] In terms of demographic predictors, like previous studies we found hesitancy was more common among women however unlike the study of Canadian workers we did not find an association between age and hesitancy. For younger women it is possible that hesitancy related to concerns about pregnancy and vaccination.

Our study extends previous studies including exploring the associations between hesitancy and their perceptions of media representations of COVID-19 and attitudes as to whether COVID-19 vaccination should be mandated among workers and whether vaccination was a community responsibility. Further, we were able to assess whether hesitancy might be related to experiences of lockdowns by comparing DSWs living in Victoria, who had experienced extended lockdowns, with other States and Territories.

Implications

In order to minimise risks from COVID-19 infection among people with disability and DSWs it will be necessary to continue to

vaccinate DSWs to protect them and the people with disability they support. This will involve booster doses, potentially with new vaccines. This will require a carefully thought through strategy to ensure DSWs understand the risks of COVID-19 infection and the safety and efficacy of the vaccines. This study shows that DSWs may be a vaccine hesitant workforce, particularly for emergent infectious diseases and when new vaccines are developed. It is possible that hesitancy was a bigger problem in Australia because few DSWs had observed the potential serious consequences of infections such as COVID-19.

These predictors of vaccine hesitancy may be similar for DSWs across the world. Therefore, governments and other stakeholders must work with DSWs to develop strategies that continue to promote vaccination in this workforce. The strategies should emphasise the importance of vaccination in reducing the occupational risks of COVID-19 and DSWs' duty of care to protect the people with disability they support from COVID-19.

Strengths and limitations

This is the one of the few studies of DSWs and vaccine hesitancy. Importantly, this study concentrates on the occupational risks of COVID-19 infection and occupational benefits of COVID-19 vaccination for DSWs and the people with disability they support. However, there are limitations to be aware of when interpreting the results of this study. First, it is not a representative survey of DSWs; for example, a large proportion of the DSWs were from Victoria. However, no register of DSWs exists in Australia and the Australian Bureau of Statistics does not collect sufficient information in the Census to separate aged and disability workers. Therefore it is not possible to do a population survey of this group or to compare our results to other surveys to ensure generalisability. Second, this is a relatively small sample, however we had sufficient power to describe the strong associations reported here. Thirdly, because Australia had not experienced high caseloads of COVID-19 at the time of the study it was not possible to ascertain whether supporting someone who died from COVID-19 or experienced serious symptoms was associated with hesitancy.

Future research

While our study found high levels of hesitancy, the majority of DSWs in Australia received COVID-19 vaccination. Future research could follow this cohort to examine what happened in terms of vaccination and what factors influenced their decision as to whether they got vaccinated. The study could also investigate whether DSWs left the workforce because of the vaccine mandates or whether mandates actually contributed to their choice to be vaccinated and whether workers have received booster COVID-19 vaccination.

One of the challenges of doing work in this field is the lack of a database where DSWs can be identified. Improving data systems to better capture this workforce is essential in responding to infectious diseases and ensuring they are vaccinated.

Conclusions

The evidence generated from this study needs to be urgently applied to continue to promote vaccination among DSWs in Australia and internationally. Further research is needed to monitor hesitancy over time and to compare these findings with other countries including those where there have not been vaccine mandates.

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Conflicts of interest

AK is a member of the Australian Government COVID-19 Advisory Committee for People with Disability. This work was done independent of her work on that committee.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dhjo.2022.101369.

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