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Permalink

https://escholarship.org/uc/item/1851n7gw

Journal

Infection Control and Hospital Epidemiology, 44(11)

ISSN

0899-823X

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Publication Date

2023-11-01

DOI

10.1017/ice.2023.51

Copyright Information

Peer reviewed

Evaluating Barriers and Potential Solutions to Speaking Up About COVID-19 Symptoms: A Survey Among Nursing Home Workers

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ABSTRACT

Objective: Quantify the frequency and drivers of unreported COVID-19 symptoms among nursing home (NH) staff

Design: Confidential telephone survey

Setting: 70 NHs in Orange County, California, December 2020-February 2022

Participants: 120 NH staff with COVID-19

Methods: We designed a 40-item telephone survey of NH staff to assess COVID-19 symptom-reporting behavior and types of barriers (monetary, logistic, and emotional (fear/stigma)) and facilitators of symptom-reporting using 5-point Likert scales. Summary statistics, reliability of survey constructs, and construct and discriminant validity were assessed.

Results: Forty-nine percent of surveys were during the 2020-2021 COVID-19 winter wave and 51% were during Delta/Omicron waves, with a relatively even distribution of certified nursing assistants, licensed vocational or registered nurses, and non-frontline staff. Most COVID-19 cases (71%) were detected during mandated weekly NH surveillance testing and most staff (67%) had ≥1 symptom prior to their test. Only 34% of those with symptoms disclosed their symptom to a supervisor. Responses were consistent across 8 discrete survey constructs with Cronbach alpha >0.7. In the first wave of the pandemic, fear and lack of knowledge were drivers of symptom-reporting. In later waves, adequate staffing and sick days were drivers of symptom-reporting. COVID-19 helplines and encouragement from supervisors enabled symptom-reporting and testing.

Conclusion: Mandatory COVID-19 testing for NH staff is key to identifying staff COVID-19 cases due to reluctance to speak up about existing symptoms. Active encouragement from supervisors to report symptoms and stay home when ill was a major driver of symptom-reporting and resultant infection prevention and worker safety measures.

Introduction

The COVID-19 pandemic has had a devastating impact on U.S. nursing homes (NHs).[1,2] Pandemic policies that restricted visitation meant that NH staff were the likely source for bringing SARS-CoV-2 from the community into NHs.[3] Thus, measures to ensure the health of NH staff have been critical to resident safety. Such measures include national recommendations for daily symptom and temperature screening to detect overt disease, mandatory weekly testing of staff to detect unrecognized cases that could cause NH outbreaks, and vaccines.[4-6]

While these strategies are well-conceived, their success is complicated by social, financial, and personal factors that could limit their prevention impact. Understanding potential barriers to COVID-19 prevention in NHs requires examination of the NH workforce. The majority of NH care is provided by certified nursing assistants (CNAs) and licensed vocational nurses (LVNs), with only a limited number of registered nurses (RNs).[7] NHs also rely on support staff to perform housekeeping, maintenance, dietary, and administrative duties. These NH workers have low wages and minimal sick days, commonly work multiple jobs, are underinsured, and often receive some form of public assistance.[8-11] In addition, supervisors experience pressure to address high staff turnover and marginal staffing, leading to intentional and unintentional influence to dismiss mild illness to ensure a full complement of staff each shift.[12,13] Thus, NH staff face significant economic and job-related pressures that may influence their willingness to report potential COVID-19 symptoms.

We evaluated symptom-reporting perceptions and behaviors among COVID-positive NH staff in Orange County, California, the sixth most populous U.S. County.[14] Using confidential telephone surveys, we sought to discern the frequency of under-reported symptoms, barriers to symptom-reporting, and the perceived value to staff of possible solutions. Understanding the frequency and drivers of under-reported symptoms among NH staff will enable more effective strategies to prevent the spread of contagious disease in NHs.

Methods

Survey Development

We designed a 40-item structured survey to evaluate symptom-reporting behavior among NH staff. Survey constructs and questions were developed based upon confidential conversations with NH staff through our ongoing role as the Orange County, California NH COVID-19 Prevention Team.[15] Although we did not use formal "grounded theory" methods[16], we performed a review of the relevant literature and used a modified Delphi approach to formulate item content through iterative discussion, comment, and revision. Many NH staff disclosed to us that they had not reported ill household contacts or COVID-like symptoms to their supervisors. Staff often conveyed longstanding concerns with finances, stigma of missing work, reprisal from supervisors, as well as fears of known and unknown consequences of COVID-19. These conversations led us to examine 8 discrete constructs related to symptom-reporting, including four barriers (fear of COVID-19, lack of knowledge, monetary barriers, logistic barriers) and four potential solutions (encouragement from supervisors/coworkers, adequate staffing, access to a confidential helpline, lack of stigma from coworkers for having COVID-19). Construct-specific items were developed to be scored on 5-point Likert scales. We also assessed participant demographics, health status, course of COVID-19 illness, frequency of participation in COVID-19 exposing activities, likelihood of seeking care when ill, and trust in COVID-19 vaccines.

Initial Testing

Prior to launch, we asked 10 NH staff to complete and comment on the survey using cognitive interviewing techniques.[17] We asked respondents about the appropriateness of survey language, word choice, format, time required to completion, and understandability of questions. Based on these responses, we modified survey language, format, and ordering of response options. The survey instrument is provided (**Supplemental Material**).

Survey Recruitment and Administration

We conducted telephone-based surveys of NH staff in Orange County, CA from December 2020-February 2022 with the goal of recruiting 120 participants. The survey was rolled out in two phases: 1) during the first pandemic wave, and 2) during subsequent (Delta/Omicron) waves, which we will term as "Wave 1" and "Wave 2". During this time, NHs were conducting routine and symptom-based testing of staff. Recruitment of COVID-positive staff was facilitated via posters shared with all 70 NHs in the county, weekly outreach to NHs with known COVID-19 staff cases based upon publicly-reported data[18], and referrals from NH leadership. Inclusion criteria included a positive COVID-19 test within the past 8 weeks, current employment in one of the 70 NHs in the county, at least 18 years of age, and willingness to participate.

Participants received a $50 electronic gift card for completing the 20–30-minute phone-based survey. Surveys were administered in English and Spanish. Participants were reassured that their participation and responses would remain confidential and not be shared with public health, co-workers, or supervisors. Data were recorded by trained study staff using a standardized instrument in REDCap (Research Electronic Data Capture).[19]

Hypotheses

Due to expanding information and access to COVID-19 vaccines over time, we expected that staff would be more likely to disclose symptoms earlier in the pandemic versus later in the pandemic and that barriers and facilitators of symptom-reporting would change over time. Additionally, given differences in job duties and level of training among staff, we expected that symptom-reporting behaviors would differ between CNAs, nurses (LVNs and RNs), and non-frontline staff (e.g., environmental services, dietary, administrative). We expected that frontline workers would be more likely to disclose symptoms given their greater level of interaction with

NH residents, and that monetary barriers would be less important for higher paid staff (e.g,. RNs/LVNs) compared to CNAs and non-frontline staff.

Analysis

Characteristics of the survey participants and responses were summarized using descriptive statistics. Cronbach's alpha was computed to assess internal consistency and reliability for responses within each construct, with α=0.7 as the benchmark for acceptable reliability.[20]

Multi-item scales were developed within the 8 constructs using simple algebraic sums of the Likert-scaled items for each construct. For example, four questions were related to the construct of "fear of known or unknown consequences of COVID-19." To create a composite scale, 5-point Likert-scaled responses to the four questions were summed together, with a minimum score of 4 and a maximum score of 20. Composite scales for each construct were then transformed to range from 0 to 100 by subtracting scale means from theoretical scale minimums and dividing the result by the difference between the theoretical scale maximum and minimum and multiplying that result by 100. Higher scale scores indicated that the barrier or facilitator was more important when deciding whether to report possible symptoms.

To assess construct validity, we calculated single-item summary scores within each of the 8 constructs. To assess discriminant validity, we used t-tests and analysis of variance to compare responses among subgroups by (1) time of positive COVID-19 test, comparing surveys conducted earlier versus later in the pandemic (e.g., Wave 1 versus Wave 2), and (2) NH staff job role (frontline versus non-frontline). All data were analyzed using SAS version 9.4.

Results

One hundred and twenty NH staff completed the survey, which represents 5% of staff COVID-19 cases countywide across the survey period. Participant characteristics are

summarized in Table 1. Forty-nine percent of surveys were conducted during the 2020-2021 winter wave ("Wave 1") and 51% were conducted during Delta and Omicron waves (June 2021-February 2022; collectively termed "Wave 2"), with a reasonable distribution of CNAs (N=44), LVNs/RNs (N=44), and non-frontline staff (N=32). Most participants were female (67%). Median age was 39.6 years. Median length of time working in NHs was 6.3 years. CNAs were more likely to hold more than one NH job and had fewer years of experience working in NHs compared to nurses and non-frontline staff.

Reason for COVID-19 Testing

Seventy-one percent (85/120) of COVID-19 cases among staff were identified during mandatory weekly NH surveillance testing, 23% (27/120) were identified after disclosing symptoms to a supervisor, and 7% (8/120) were identified after disclosing a COVID-19 exposure. Significantly more cases were detected via symptom-based testing (31% versus 15%, P=0.04) and significantly fewer cases were detected via mandatory testing (81% versus 59%, P=0.006) during Wave 1 versus Wave 2. Reasons for testing were similar across job roles. A non-significantly greater proportion of cases were detected via symptom-based testing among frontline staff (CNAs: 30%, LVNs/RNs: 23%) versus non-frontline staff (13%) (P=0.11).

Symptom-Reporting at Time of Testing

Overall, 67% of staff (80/120) were symptomatic at the time of testing (**Figure 1**). Among symptomatic staff, only 34% (27/80) disclosed their symptoms to a supervisor prior to testing. The most common symptoms present at testing and not reported to a supervisor were extreme fatigue, headache, and lack of appetite. Among cases identified by mandatory weekly testing, sixty-one percent (52/85) were symptomatic at the time of testing and did not disclose symptoms to a supervisor prior to their test (**Figure 1, black bars**).

Likelihood of Reporting Hypothetical Symptoms to a Supervisor

In a hypothetical question, participants were asked on a scale of 1-5 how likely they would be to report specific symptoms to a supervisor, not all of which were related to COVID-19. Responses are summarized in Table 2. Across all participants, the mean likelihood of reporting any symptom was 67.5 out of 100. Overall, participants were more likely to report symptoms such as fever, chills, cough, shortness of breath, loss of taste or smell, and nausea, diarrhea or vomiting (likelihood scale score >75) compared to symptoms such as fatigue, headache, cramps, muscle spasms, body aches, or lack of appetite. Likelihood of reporting was significantly greater during Wave 1 versus Wave 2 (likelihood scale score 75 versus 60, P=0.01) and non-significantly greater among frontline versus non-frontline staff (69 versus 65, P=0.53).

Drivers of Symptom-Reporting

Responses were consistent across the 8 discrete survey constructs related to symptom-reporting (**Table 3**). Overall, fear and encouragement from supervisors were the most salient factors for speaking up about COVID-19 symptoms with importance values >80 on a scale of 100 (**Table 4**).

As hypothesized, barriers and facilitators of symptom-reporting differed between Waves 1 and 2. Fear (P<0.01) and lack of knowledge (P=0.004) were greater drivers of symptom-reporting during Wave 1 versus Wave 2, while monetary barriers were less important during Wave 1 versus Wave 2 (P<0.001). Encouragement from supervisors (P=0.02) and access to a confidential helpline (P<0.001) were greater drivers of symptom-reporting during Wave 1 versus Wave 2, while adequate staffing (P<0.001) and lack of stigma from coworkers were less important during Wave 1 versus Wave 2 (P<0.001).

In contrast, barriers and facilitators of symptom-reporting were mostly similar between frontline and non-frontline staff. Lack of knowledge about known or unknown consequences of COVID-19 (P=0.004) and encouragement from supervisors (P=0.02) were more important

drivers of symptom-reporting for frontline versus non-frontline staff, while adequate staffing was a less important driver for frontline versus non-frontline staff (P=0.008). While not statistically significant, we found that monetary barriers were less important for RNs/LVNs compared to CNAs and non-frontline staff (importance score of 63.1 for RNs/LVNs versus 71.0 for CNAs and 74.5 for non-frontline staff; analysis of variance P=0.23).

Discussion

NHs are high-risk settings for COVID-19 and other contagious disease threats. Ensuring that staff report potential symptoms and stay home when ill is crucial for outbreak prevention and resident safety. Our study found that two-thirds of symptomatic NH staff failed to disclose their symptoms to a supervisor, with fatigue, headache, and lack of appetite being the most commonly under-reported symptoms. We also identified early and late pandemic drivers of symptom-reporting. Specifically, fear and lack of knowledge were important early drivers, while adequate staffing and sick days were important later drivers of symptom-reporting as fear and knowledge improved with time.

As expected, frontline staff were more likely to disclose symptoms to a supervisor, prompting testing, compared to non-frontline staff. Although this was not a statistically significant finding, it suggests that staff who are directly involved with resident care more readily report symptoms and seek testing. We were surprised to find that barriers and facilitators of symptom-reporting were mostly similar between frontline and non-frontline staff. Despite not being statistically significant, the fact that monetary barriers were scored as more important by CNAs and non-frontline workers versus RNs and LVNs aligns with our hypothesis that financial pressures influence symptom-reporting, especially among lower-paid workers.

This study has important limitations. First, while we used a novel survey instrument for this study, our main goal was to generate inferences relevant to NH infection prevention rather than validate a new survey tool. Second, our findings may be impacted by social desirability

bias, in which respondents are more likely to give socially desirable answers despite assurance of confidentiality. This may explain the discordance between the high likelihood (67.5 out of 100) of reporting hypothetical symptoms versus the fraction of symptomatic staff that actually disclosed their COVID-19 symptoms to a supervisor (only 34%). Third, participants were a convenience sample of NH staff in a single region and were more likely to be long-stay employees with a median of 6 years of NH experience, limiting generalizability. Fourth, our survey was conducted during a pandemic and may not be indicative of drivers of symptom-reporting for seasonal illness or routine colds.

This study also has several strengths. Notably, we identified actionable targets for improving NH infection prevention by encouraging symptom-reporting and staying home while ill. The most effective factor promoting symptom-reporting was supervisor encouragement (importance factor: 89). This is particularly important given the conflict of interest that supervisors feel because sending an ill worker home results in short staffing. Establishing non-punitive policies, improving sick leave benefits, improving staffing coverage options, and improving worker health and resiliency should be explored to strengthen NH infection prevention and control efforts. Importantly, our findings reinforce the value of mandatory symptom screening and weekly surveillance testing of NH staff during a pandemic, confirming the presence of many factors that drive reluctance to speak up about potential symptoms.

We show that failure to disclose symptoms remains pervasive among NH staff even during a high-risk pandemic period. When fear was high early in the pandemic, staff were more willing to report symptoms. As fear was mitigated, mandatory weekly testing became more important for identifying NH staff COVID-19 cases. Supervisor encouragement, confidential helplines, improved staffing levels, and allayment of fears are positive factors that may promote symptom-reporting among nursing home staff and improve nursing home safety.

Figure 1.
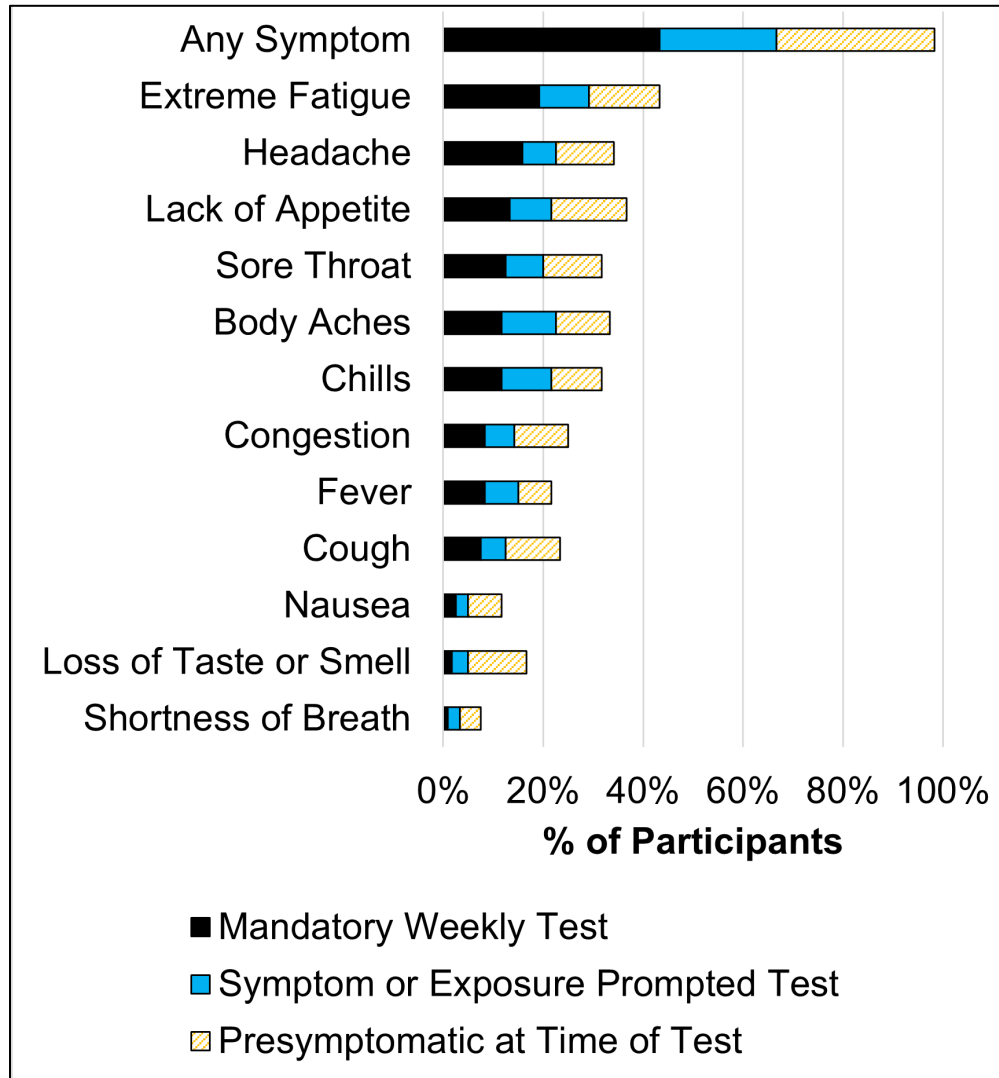
Figure Legend

Figure 1. This bar graph illustrates symptoms present at the time of COVID-19 testing. Bars are sorted by symptoms present at the time of mandatory weekly testing (black bars). One hundred eighteen participants (98.3%) are shown in the graph. Eighty participants (66.7%) had at least 1 symptom prior to testing. Thirty-eight participants (31.6%) developed symptoms after testing. Two participants (1.6%) never developed symptoms.

Table 1. Characteristics of Nursing Home (NH) Staff Survey Participants

Characteristic	Overall (N=120)	Subgroups by COVID-19 Wave		Subgroups by Job Role		
		"Wave 1" [a] (N=59)	"Wave 2" [a] (N=61)	CNA [b] (N=44)	LVN/RN [b] (N=44)	Non-Frontline [b] (N=32)
Female	80 (67%)	47 (80%)	33 (54%)	29 (66%)	32 (73%)	19 (59%)
Mean Age in Years	39.6	39.4	39.9	36.2	44.2	38.0
Mean # of Current NH Jobs	1.3	1.6	1.1	1.6	1.2	1.1
Mean # of Years in Current Job	6.3	5.9	6.6	5.6	7.0	6.1
Mean # of Years Working in Any NH	9.3	9.7	9.0	8.3	11.7	7.5
Mean Household Size	4.2	3.9	4.6	4.7	3.3	4.9
Mean # of Weeks since Positive Test	2.9	4.2	1.7	3.9	1.9	3.0
Mean Health Rating (1-5 Scale) [c]	4.0	4.4	3.7	4.0	4.3	3.8
Reason for Testing						
Mandatory Weekly Testing	85 (71%)	35 (59%)	50 (81%)	30 (68%)	31 (70%)	24 (75%)
≥1 Symptom Prior to Test	52 (61%)	21 (60%)	31 (62%)	21 (70%)	19 (61%)	12 (50%)
Known Close Contact COVID-19 Exposure	8 (7%)	6 (10%)	2 (3%)	1 (2%)	3 (7%)	4 (14%)
≥1 Symptom Prior to Test	1 (13%)	1 (17%)	0 (0%)	0 (0%)	1 (33%)	0 (0%)
Symptom-Based Testing (Reported to Supervisor)	27 (23%)	18 (31%)	9 (15%)	13 (30%)	10 (23%)	4 (13%)
Frequency of Participation in COVID-19 Exposing Activities (0-100 Scale) [d]	26.6	11.6	41.1	26.7	19.9	35.6
Likelihood of Seeking Care When Ill (0-100 Scale) [d]	60.5	74.6	47.3	68.2	55.3	56.7
Trust in COVID-19 Vaccines (0-100 Scale) [e]	58.1	62.2	54.3	59.9	56.0	58.6

[a] Wave 1 represents surveys completed during the 2020-2021 winter wave. Wave 2 represents surveys completed during the Delta/Omicron waves in 2021-2022. [b] Subsets by job role include certified nursing assistants (CNAs), nurses, and non-frontline staff (e.g., environmental services, dietary, administrative). The survey cohort included 4 rehabilitation staff (3 respiratory therapists and 1 rehab manager) that were categorized as direct care staff and grouped with LVNs/RNs. Higher score indicates [c] better self-reported health, [d] more likely to engage in activity, [e] greater level of trust.

Table 2. Likelihood of Reporting Hypothetical Symptoms to a Supervisor

Symptom	Overall (N=120)	Subgroups by COVID-19 Wave		Subgroups by Job Role		
		"Wave 1"[a] (N=59)	"Wave 2" [a] (N=61)	CNA [b] (N=44)	LVN/RN [b] (N=44)	Non-Frontline [b] (N=32)
	Scale 0 to 100 for Likelihood to Report [c]					
Fever (>101 F)	95.0	100.0	92.5	97.5	95.0	95.0
Nausea, vomiting, diarrhea	92.5	95.0	90.0	87.5	92.5	97.5
Fever (99 to 101F)	90.0	90.0	90.0	90.0	87.5	90.0
Shortness of breath	90.0	95.0	85.0	90.0	92.5	87.5
Chills	85.0	87.5	80.0	85.0	85.0	85.0
Loss of taste or smell	82.5	90.0	75.0	82.5	82.5	82.5
Cough	80.0	82.5	80.0	82.5	77.5	82.5
Sore throat	72.5	77.5	65.0	67.5	75.0	72.5
Runny nose or congestion	72.5	70.0	72.5	67.5	75.0	75.0
Excessive fatigue	67.5	95.0	42.5	72.5	70.0	57.5
Body aches	62.5	75.0	50.0	60.0	62.5	60.0
Joint stiffness	57.5	65.0	47.5	57.5	60.0	52.5
Muscle spasms	55.0	62.5	47.5	55.0	57.5	50.0
Abdominal cramps	52.5	57.5	47.5	50.0	57.5	50.0
Moderate fatigue	50.0	70.0	30.0	60.0	50.0	40.0
Headache	50.0	67.5	35.0	60.0	47.5	45.0
Lack of appetite	50.0	62.5	37.5	47.5	55.0	47.5
Lower back pain	47.5	57.5	37.5	50.0	50.0	42.5
Mild fatigue	37.5	45.0	27.5	40.0	40.0	27.5
Any Symptom	67.5	75.0	60.0	67.5	70.0	65.0

[a] Wave 1 represents surveys completed during the 2020-2021 winter wave. Wave 2 represents surveys completed during the Delta/Omicron waves in 2021-2022.

[b] Subsets by job role include certified nursing assistants (CNAs), nurses, and non-frontline staff (e.g., environmental services, dietary, administrative). The survey cohort included 4 rehabilitation staff (3 respiratory therapists and 1 rehab manager) that were categorized as direct care staff and grouped with LVNs/RNs.

[c] Responses to the question "If you had one of the below symptoms (not all of which are COVID-19 symptoms), how likely would you be to report it to an immediate supervisor?" were recorded on a scale of 1-5 with 1 being "extremely unlikely" to report and 5 being "extremely likely" to report. Responses were transformed to a 0-100 scale. A higher score indicates that staff are more likely to report a given symptom.

Table 3. Reliability of Responses by Survey Construct

Survey Construct	Number of Questions	Cronbach's Alpha [a]
Barriers to Symptom-Reporting		
Fear of Known or Unknown Consequences of COVID-19	4	0.93
Lack of Knowledge About COVID-19 Symptoms and Spread	2	0.94
Monetary (e.g., paid sick days, doctor co-pay)	3	0.71
Logistic (e.g., access to a test, doctor)	2	0.85
Positive Factors to Promote Speaking Up About COVID-19 Symptoms		
Encouragement from Supervisors and Coworkers	2	0.83
Adequate Staffing to Cover if You Cannot Work	1	N/A [a]
Access to a Confidential Helpline	5	0.96
Lack of Stigma from Coworkers for Having COVID-19	1	N/A [a]

[a] Cronbach alpha values of 0.7 or higher indicate "acceptable" internal consistency.[20] Cronbach alpha not reported for constructs with only one question.

Table 4. Barriers and Facilitators of Symptom-Reporting Among Nursing Home Staff [a]

	Overall	Subgroups by COVID-19 Wave		Subgroups by Job Role			Wave 1 vs 2		Frontline vs Non-Frontline	
		"Wave 1" [b]	"Wave 2" [b]	CNA [c]	LVN/ RN [c]	Non-Frontline [c]	Mean Difference	P-value	Mean Difference	P-value
Scale 0 to 100 for Importance When Deciding to Report Possible Symptoms [d]										
Barriers to Symptom-Reporting										
Fear of Known or Unknown Consequences of COVID-19	80.5	92.2	69.2	84.9	80.4	74.4	23.0	**<0.001**	-8.3	0.183
Lack of Knowledge of COVID-19 Symptoms and Spread	74.1	82.6	65.8	75.3	82.1	61.3	16.8	**0.004**	-17.4	**0.019**
Monetary (e.g., paid sick days, doctor co-pay)	69.0	58.2	79.5	71.0	63.1	74.5	-21.3	**<0.001**	7.4	0.236
Logistics (e.g., access to a test, doctor)	56.5	53.1	59.8	53.4	54.5	63.5	-6.7	0.240	9.6	0.147
Positive Factors to Promote Speaking Up About COVID-19 Symptoms										
Encouragement from Supervisors and Coworkers	89.0	93.5	84.8	92.5	91.9	80.4	8.7	**0.015**	-11.9	**0.024**
Adequate Staffing to Cover if You Cannot Work	71.0	57.2	84.4	66.5	66.5	83.6	-27.2	**<0.001**	17.1	**0.008**
Access to a Confidential Helpline	68.2	93.1	46.6	74.2	62.3	67.7	46.5	**<0.001**	-0.7	0.922
Lack of Stigma from Coworkers for Having COVID-19	60.0	35.2	84.0	54.5	58.0	70.3	-48.8	**<0.001**	14.1	0.074

[a] To assess discriminant validity, t-tests were performed comparing responses among subgroups expected to differ by time of positive COVID-19 test and NH staff job role (frontline versus non-frontline).

[b] Wave 1 represents surveys completed during the 2020-2021 winter wave. Wave 2 represents surveys completed during the Delta/Omicron waves in 2021-2022.

[c] Subsets by job role include certified nursing assistants (CNAs), nurses, and non-frontline staff (e.g., environmental services, dietary, administrative).

[d] A higher score indicates that the construct matters more for symptom-reporting.

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