

# The Well-being of Brazilian Industry Workers on Returning to the Physical Workplace During the COVID-19 Pandemic

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**Objective:** Our aim was to assess the prevalence and predictors of well-being among Brazilian industry workers on returning to the physical workplace during the COVID-19 pandemic. **Methods:** Two thousand two hundred forty-one participants completed an online survey between October and November 2021. Well-being was assessed with the World Health Organization Well-being Index, and the questionnaire also addressed sociodemographic and occupational characteristics and the health of workers and their contacts. Associations were estimated with logistic regression models. **Results:** The prevalence of adequate well-being was 63.15%. The predictors of poor well-being included being female, younger, working exclusively from home or on a hybrid model, having comorbid disorders, and living with someone with any comorbidity. **Conclusions:** The identification of vulnerable groups with poor well-being may help organizations to direct efforts to the unmet psychological needs of these employees and develop well-being programs during this transition.

**Keywords:** Brazil, COVID-19, industry, return to work, well-being, workers, working from home

## LEARNING OUTCOMES

Upon reading this article, readers will be able to:

- Critically analyze the psychological well-being of workers returning to their physical workplace, indicating those under greater likelihood of poor well-being.
- Describe at least two plausible mechanisms of poor well-being among vulnerable workers.

On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic.<sup>1</sup> The rapid dissemination of the highly pathogenic SARS-CoV-2 virus has led to a steep increase in morbidity and mortality rates,<sup>2,3</sup> spreading fear and distress, and affecting almost every dimension of human life.

To minimize the virus transmission, governments prescribed handwashing, mask-wearing, and physical distancing and adopted measures such as the closure of borders, schools, nonessential businesses, and workplaces, along with mobility restrictions, lockdowns, and quarantines.<sup>4</sup>

Although necessary, these public health measures contributed to adverse psychological, economic, and social effects.<sup>5,6</sup> Furthermore, the historically exaggerated fear of infectious diseases<sup>7</sup> gave rise, in the age of social media, to information overload both online and offline, termed as “COVID-19 infodemic,”<sup>8</sup> the rapid spread of fake news, misinformation, conspiracy theories, racism, and “magical” cures.

Altogether, these elements resulted in the overlap of risk factors for psychopathology during the pandemic, such as social isolation and loneliness<sup>9,10</sup>; fear of being infected, dying, or witnessing the death of a family member or friend<sup>11,12</sup>; the increase in domestic violence<sup>13,14</sup>; the possibility of losing one's job or income; and increased food insecurity and social vulnerability.<sup>15</sup> As a consequence, the pandemic was associated with low levels of well-being in the general population<sup>16-20</sup> and with high prevalence of psychological distress, psychiatric symptoms, and mental disorders.<sup>21-25</sup> These findings were further confirmed by longitudinal studies demonstrating impaired well-being and worse mental health during the pandemic compared with the prepandemic period and/or along successive pandemic waves.<sup>26-31</sup> A systematic review and meta-analysis of longitudinal studies during the first year of the pandemic found an increased prevalence of anxiety and depressive symptoms from March to May 2020, with a decrease in the prevalence of these conditions in subsequent months. Psychological distress, measured by rating scales, remains high during the whole pandemic, with a spike after July 2020.<sup>32</sup>

In addition to the aforementioned psychosocial stressors that affect the general population,<sup>33</sup> workers are an especially vulnerable group to the impacts of COVID-19,<sup>34</sup> and the “world of work” has been one of the sectors most severely affected by the pandemic.<sup>35</sup> Globally, many workers had to quickly start working from their homes (WFH).

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**Ethical considerations and disclosures:** Employees were informed about the study, its goals and relevance, and its voluntary nature by their companies' human resources, occupational health, and communication sectors, which indicated the survey's URL and QR code to the survey platform. After accessing the Web site, respondents were informed about the voluntary and anonymous nature of their participation and the confidentiality of responses. Access to the online questionnaire was possible only after agreement with the informed consent, in which they were instructed of the survey's goals and potential benefits and risks, as well as the name, affiliation, and contact of the responsible researcher. The study procedures were approved by the Ethical Compliance Committee on Research Involving Human Beings of Fundação Getúlio Vargas (protocol 186/2021).

**Funding sources:** This work was supported by Viatrix Inc. The funder had no role in the study design, data collection and analysis, decision to publish, or preparation of the manuscript.

**Conflicts of interest:** None declared.

All authors contributed to this study. Specifically, G.L.S. was responsible for study conceptualization, methodology, investigation, data curation, formal analysis, and writing the original draft. M.C.B. was responsible for study conceptualization, investigation, methodology, and writing the original draft. G.A.G.M. was responsible for study conceptualization, methodology, and investigation. A.J.N.O. was responsible for study conceptualization, project administration, formal analysis, writing the original draft, and reviewing and editing the manuscript. A.M.M. was responsible for study conceptualization, project administration, methodology, investigation, and reviewing and editing the manuscript. L.H.A. was responsible for study conceptualization, project administration, methodology, investigation, formal analysis, and reviewing and editing the manuscript.

Supplemental digital contents are available for this article. Direct URL citation appears in the printed text and is provided in the HTML and PDF versions of this article on the journal's Web site ([www.joem.org](http://www.joem.org)).

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In Australia, France, and the United Kingdom, for example, almost 50% of employees teleworked during lockdowns in 2020.<sup>36</sup>

In Brazil, the massive impact of the pandemic was due to the convergence of historical social and health inequalities with inadequate political decisions. Just 5 months after the first patient was diagnosed with COVID-19 in the country, on February 25, 2020,<sup>37</sup> Brazil became an emergent epicenter of the pandemic, with the second highest total number of confirmed cases in the world.<sup>38</sup>

In most cases, transition to WFH in Brazil was neither planned nor organized. During the month of May 2020, 13.3% of the Brazilian employed population not on temporarily leave were working from home. In November, 9.1% remained WFH, which represents a 15.8% reduction in those who were remote working.<sup>39</sup>

Working from home is associated with a perception of greater productivity and advantages such as greater concentration on activities and not having to commute to the physical workplace. However, the risks to the workers' emotional well-being and mental health cannot be neglected. In general, there is an increase in hours worked and workload, usually having to be reconciled with domestic activities, as well as private and family life. This often results in suboptimal conditions for the proper exercise of remote work and has a negative impact on relationships. Moreover, many face loneliness in remote work, and communication difficulties with the team were common in the first months WFH during the pandemic.<sup>40,41</sup>

However, most of the Brazilian employed population had to work on site. They had to maintain a constant vigilance regarding preventive measures, and this persistent state of alertness and the fear of contagion increased their psychological burden and stress level,<sup>34</sup> beyond what was already expected for other people during the pandemic. Most people who had to work on site were informal workers and workers in strategic areas, such as health professionals and industry employees, because the industrial sector was included in the list of essential activities in the beginning of the pandemic.<sup>42</sup>

Indeed, the industrial sector played a key role in fostering socioeconomic resilience during the COVID-19 pandemic. Furthermore, it is one of the most important driving forces of the postpandemic economic recovery.<sup>43</sup>

To play this fundamental role, industry companies need to optimize their productivity, which largely depends on the performance of its workers.<sup>44</sup> Literature has shown that employee well-being is one of the most important factors for organizational success and performance.<sup>45–48</sup>

The aim of this study was to evaluate the well-being of Brazilian industry workers on the phase of returning to the physical workplace during the COVID-19 pandemic.

As stated previously, 1 year after becoming an emergent epicenter of the pandemic,<sup>38</sup> Brazil had a period of sustained reduction in the number of new cases and deaths from COVID-19 between July and December 2020. This happened because of the increasing proportion of the population who had completed the initial vaccination protocol. However, this happened just before the worsening of the pandemic because of the spread of the omicron variant (see Figure, Supplemental Digital Content 1, <http://links.lww.com/JOM/B265>).

During this *intermezzo*, public health measures were relaxed, many businesses started to reopen, and people's mobility increased. In many industry companies, larger volumes of the workforce started returning to their physical workplaces. As seen, part of this effort to recover industry productivity depends on the health and well-being of their employees.

Despite the multiple definitions of well-being, it may be conceptualized as the individual's satisfaction with himself and with his environment,<sup>49</sup> resulting in increased mood, vitality, and general interest.<sup>50</sup>

The research questions (RQs) of this study are:

- RQ1. What is the prevalence of adequate well-being among Brazilian industry workers during the phase of returning to the physical workplace?
- RQ2. To what extent work-related characteristics are associated with psychological well-being?
- RQ3. Are workers' sociodemographic characteristics associated with their well-being?
- RQ4. Is well-being associated with workers' health status?
- RQ5. Does the health status of workers' family members, friends, coworkers, or supervisors predict workers' well-being?

## METHODS

### Study Design, Sampling, and Assessment

This is a cross-sectional survey based in a convenience sample of workers from nine companies from the manufacturing and construction sectors<sup>51</sup> that remained active during the pandemic, affiliated to the Brazilian National Industry Confederation, the main representative confederation of Brazil's industry.

Employees were informed about the study, its goals and relevance, and its voluntary nature by their companies' human resources, occupational health, and communication sectors, which indicated the survey's URL and QR code on the Qualtrics platform.<sup>52</sup> Multiple responses from the same IP address were not allowed.

The self-response questionnaire was available online from October 13 to November 14, 2021. During this 1-month period, the proportion of the Brazilian population who had completed the initial vaccination protocol increased from 47.1% to 58.4%; the 7-day rolling average of new confirmed cases decreased from 11,298.14 to 11,066.86, and the 7-day rolling average of confirmed deaths decreased from 316.14 to 261.43.<sup>53</sup>

After accessing the Web site, respondents were informed about the voluntary and anonymous nature of participation and confidentiality of responses. Access to the online questionnaire was possible only after agreement with the informed consent, in which they were instructed of the survey's goals and potential benefits and risks, as well as name, affiliation, and contact of the responsible researcher. The study procedures were approved by the Ethical Compliance Committee on Research Involving Human Beings of Fundação Getúlio Vargas (protocol 186/2021).

A total of 2254 employees accessed the Web site, but 13 individuals did not have access to the online questionnaire for not agreeing with the informed consent. The final sample was therefore composed of 2241 subjects.

### Measurements

Psychological well-being is the dependent variable of the study and was measured using the Brazilian Portuguese version<sup>54</sup> of the WHO Well-being Index (WHO-5).<sup>50,55</sup> This short questionnaire of five simple and positively phrased items allows a quick evaluation of well-being (mood, vitality, and general interest). The respondent is asked to rate how well each of the five items applies to him or her over the past 2 weeks. Each item is scored from 0 ("at no time") to 5 ("all the time"). The raw score is calculated by totaling the figures of the five answers and may range from 0 (absence of well-being) to 25 (maximal well-being). A score of less than 13 is indicative of poor well-being.<sup>50</sup> In this report, we used this cutoff point to dichotomize the variable into "poor well-being" (WHO-5 <13) and "adequate well-being" (WHO-5 ≥13). In our sample, WHO-5 showed good internal consistency (Cronbach  $\alpha = 0.91$ ).

A series of explanatory variables were grouped into work-related characteristics; sociodemographic characteristics; personal health status; and health status of relatives, friends, coworkers, and supervisors.

Work-related characteristics include job position ("administrative," "production," "sales, logistics, or external job," "cleaning, maintenance, or security team," or "other position") and current work situation ("full-time in-company," "hybrid work model," ie, a mixture of in-company and remote work, "working exclusively from home," or "on temporary leave").

Sociodemographic characteristics include sex (male or female), age (<30, 30 to 39, 40 to 49, or  $\geq 50$  years), education level (“high school or less,” “college or university,” or “postgraduate”), marital status (“never married,” “married or cohabiting,” or “previously married”—separated, divorced, or widowed), having offspring (no or yes), and living arrangements (“living with a partner or spouse,” “living with a partner or spouse, and one or more children,” “living with a partner or spouse, and one or both parents,” “living with one or more children,” “living with one or both parents,” “living with one or more children, and one or both parents,” “living with other relatives,” “living with friends or coworkers,” or “living alone”).

Personal health status includes having a diagnosis of any comorbid chronic medical condition, that is, obesity, cardiovascular disease, diabetes, chronic lung disease, chronic kidney disease, or another chronic medical condition (no or yes); personal history of COVID-19 symptoms or diagnosis (“no,” “asymptomatic infection,” “symptomatic, but not tested,” or “confirmed COVID-19”); and vaccination for COVID-19 (“not vaccinated,” “partially vaccinated,” ie, received only the first dose of a two-dose vaccine, “fully vaccinated with the initial protocol,” or “received one booster dose”).

Health status of family members, friends, coworkers, and supervisors includes living with someone diagnosed with any of the aforementioned comorbidity (no or yes), full COVID-19 vaccination of everyone who lives with the subject (no or yes), and history of death from COVID-19 among relatives, friends, coworkers or supervisors (“no,” “yes, one or more relatives or friends,” “yes, one or more coworkers or supervisors,” “yes, both relatives or friends, and coworkers or supervisors”).

## Statistical Analysis

The statistical analysis followed the conceptual framework below (Fig. 1):

## Descriptive Statistics

First, the sample was described according to study variables, including absolute frequencies and proportions, and their standard errors were estimated. Also, the internal consistency of the WHO-5 index was assessed with Cronbach  $\alpha$  coefficient.

Next, the prevalence of adequate well-being was calculated, and cross-tabulations were used to obtain its prevalence estimates for each predictor variable.

## Analytical Statistics

Univariate associations of adequate well-being with each independent variable were estimated using logistic regression analyses, followed by a multivariate logistic regression analysis including all independent variables to obtain a final fully adjusted model.

Regression coefficients were exponentiated to provide crude and adjusted odds ratios (cOR and aOR, respectively), along with corresponding 95% confidence intervals (95% CI).

The goodness of fit of the final fully adjusted model was estimated with the Hosmer-Lemeshow test.<sup>56,57</sup> This final fully adjusted model had a good fit, as indicated by the result of the Hosmer-Lemeshow  $\chi^2$  test of 14.80;  $P = 0.0631$ .

All analyses were conducted with Stata SE 17.<sup>58</sup> Variances were computed using Taylor series linearization,<sup>59</sup> and statistical significance was evaluated using two-sided design-based tests at the 0.05 level of significance.

## RESULTS

### Sample Characteristics

The sample was composed of 2,241 industry workers, with a slight predominance of women (55.67%), and most participants between 30 and 49 years (68.51%). Highly educated subjects were the majority: 87.43% held a college or university degree, or a postgraduate level (Table 1).

More than half of the sample were married or cohabiting (65.49%), whereas more than one-fourth (27.67%) had never married. Most respondents had offspring (55.63%), and one in each three lived with their partner or spouse and children (32.39%), closely followed by those who lived with their partner or spouse and no child (31.13%). Less than 10% of respondents lived alone.

Most individuals held an administrative position (55.07%); almost equal proportions worked on “sales, logistics, or external job” or on the production line (13.27% vs 14.75%, respectively). Only a small proportion worked in “cleaning, maintenance, or security” (2.95%).

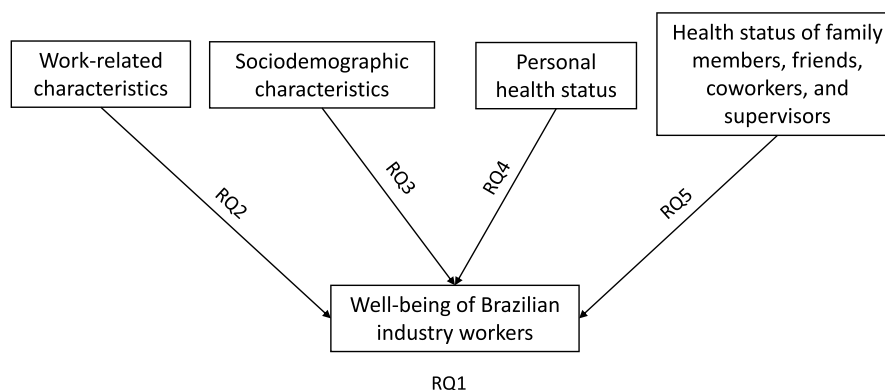
Almost half of the sample was working exclusively from home (47.28%), whereas 31.24% were full-time in company. Slightly more than one-fifth (21.06%) were on a hybrid work model, a mixture of in-company and remote work.

More than one-third of the sample (35.36%) had one or more diagnosed comorbidities that would put them at higher risk of complicated COVID-19 disease. However, most were fully vaccinated with the initial protocol (89.68%).

More information on the sample characteristics can be found in Table 1.

### Prevalence of Subjective Well-being over the Previous 2 Weeks, Its Estimates According to Explanatory Variables, and Corresponding Associations

Approximately 63% of the respondents presented adequate well-being (Table 1), and its prevalence estimates varied according



**FIGURE 1.** Conceptual framework of the study “The Well-being of Brazilian Industry Workers on Returning to the Physical Workplace during the COVID-19 Pandemic,” Brazil, 2021 (N = 2,241).

**TABLE 1.** Sample Characteristics

Variables	n	%	SE
<b>Sociodemographic characteristics</b>			
Sex			
Male	974	44.33	1.06
Female	1,223	55.67	1.06
Age, y			
<30	447	20.40	0.86
30–39	813	37.11	1.03
40–49	688	31.40	0.99
≥50	243	11.09	0.67
Education level			
High school or less	276	12.56	0.71
College or university	954	43.42	1.06
Postgraduate	967	44.01	1.06
Marital status			
Never married	595	27.67	0.96
Married or cohabiting	1,408	65.49	1.02
Previously married*	147	6.84	0.54
Having offspring			
No	954	44.37	1.07
Yes	1,196	55.63	1.07
Living arrangements			
Living with a partner or spouse	668	31.13	1.00
Living with a partner or spouse and children	695	32.39	1.01
Living with a partner or spouse and parents	15	0.70	0.18
Living with a partner or spouse, children, and parents	19	0.89	0.20
Living with children	139	6.48	0.53
Living with parents	319	14.86	0.77
Living with children and parents	6	0.28	0.11
Living with other relatives	44	2.05	0.31
Living with friends or coworkers	37	1.72	0.28
Living alone	204	9.51	0.63
<b>Work-related characteristics</b>			
Job position			
Administrative	1,195	55.07	1.07
Production	320	14.75	0.76
Sales, logistics, or external job	288	13.27	0.73
Cleaning, maintenance, or security teams	64	2.95	0.36
Other position	303	13.96	0.74
Current work situation			
Full-time in company	678	31.24	0.99
Hybrid work model <sup>f</sup>	457	21.06	0.88
Working exclusively from home	1,026	47.28	1.07
On temporary leave	9	0.41	0.14
<b>Personal health status</b>			
Any diagnosed comorbidity <sup>‡</sup>			
No	1,391	64.64	1.03
Yes	761	35.36	1.03
History of COVID-19			
No	1,556	72.30	0.96
Asymptomatic infection	59	2.74	0.35
Symptomatic, but not tested	65	3.02	0.37
Confirmed COVID-19	472	21.93	0.89
Vaccination for COVID-19			
Not vaccinated	14	0.65	0.17
Partially vaccinated <sup>§</sup>	194	9.01	0.62
Fully vaccinated with the initial protocol	194	89.68	0.66
Received one booster dose	14	0.65	0.17
<b>Health status of family members, friends, coworkers, and supervisors</b>			
Living with someone with any diagnosed comorbidity <sup>‡</sup>			
No	1,115	57.80	1.12
Yes	814	42.20	1.12
Full COVID-19 vaccination of everyone who lives with the subject			
No	669	34.68	1.08
Yes	1,260	65.32	1.08
Has any of your family members, friends, coworkers, or supervisors died of COVID-19?			
No	860	40.32	1.06
Yes, one or more family members or friends	879	41.21	1.06

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TABLE 1. (Continued)

Variables	n	%	SE
Yes, one or more coworkers or supervisors	94	4.41	0.44
Yes, both family members or friends, and coworkers or supervisors	300	14.06	0.75
Well-being <sup>†</sup>			
Adequate well-being <sup>†</sup>	1,340	63.15	1.05
Poor well-being <sup>‡</sup>	782	36.85	1.05

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\*Separated, divorced, or widowed.

<sup>†</sup>A mixture of in-company and remote work.

<sup>‡</sup>Obesity, cardiovascular disease, diabetes, chronic lung disease, chronic kidney disease, or another chronic medical condition.

<sup>§</sup>Received only the first dose of a two-dose vaccine.

<sup>¶</sup>Before dichotomization, the raw scores of WHO-5 varied from 0 (absence of well-being) to 25 (maximal well-being), with a mean of 14.30 (SE, 0.12).

<sup>††</sup>WHO-5  $\geq 13$ .

<sup>‡‡</sup>WHO-5 < 13.

n, Absolute frequency; %, proportion; SE, standard error; WHO-5, World Health Organization Well-being Index.

to job position. Workers of the “cleaning, maintenance, or security teams” presented the highest estimate of adequate well-being (85.48%), whereas the lowest estimate was found among administrative workers (57.69%). All other job positions, except for the residual category “other positions,” had increased odds of presenting adequate well-being, compared with administrative employees. However, when controlled for all other variables in the fully adjusted model, only “sales, logistics, or external workers” had increased odds of adequate well-being, and they were 1.50 more likely to present adequate well-being than “administrative” workers ( $P = 0.012$ ) (Table 2).

Regarding current work situation, employees working full-time in company had the highest prevalence of adequate well-being in opposition to those on temporary leave (74.81% vs 33.33%). Compared with employees full-time in company, workers on a hybrid work model working exclusively from home and on temporary leave had significantly lower odds of adequate well-being: cOR, 0.51 ( $P < 0.001$ ); cOR, 0.45 ( $P < 0.001$ ); and cOR, 0.17 ( $P = 0.012$ ), respectively, results that remained significant in the fully adjusted model.

Concerning sociodemographic characteristics, women had a significantly lower prevalence of adequate well-being than men (56.53% vs 71.44%, respectively). In the fully adjusted model, compared with

men, women remained inversely associated with adequate well-being (aOR, 0.59;  $P < 0.001$ ), that is, regardless of other sociodemographic variables, occupational characteristics, and personal or contacts' health status (Table 3).

For the other demographic variables, only age remained significant in the fully adjusted model, with those in the age brackets of 40 to 49 years being almost two times more likely to present adequate well-being than those younger than 30 years, with the likelihood increasing to almost three times in those 50 years or older.

Respondents who had studied up to high school had the highest prevalence of well-being (78.29%). In the unadjusted model, higher education level was associated with decreased odds of well-being (cOR, 0.40 [ $P < 0.001$ ] for those who completed college or university and 0.47 for those with a postgraduation diploma).

Compared with the never married, prevalence estimates and odds of adequate well-being were higher for workers with a partner or spouse (65.35%; cOR, 1.42;  $P < 0.001$ ) and those previously married (66.67%; cOR, 1.50;  $P = 0.037$ ).

Moreover, workers with offspring had higher prevalence and odds of adequate well-being compared with workers who did not have children (67.68% vs 57.48%; cOR, 1.55,  $P < 0.001$ ), and those who

TABLE 2. Distribution of Adequate Well-being According to Job Position and Current Work Situation, and Corresponding Univariate and Fully Adjusted Multivariate Associations

Brazilian Industry Workers' Characteristics	Adequate Well-being* in the Previous 2 wk					
	Distribution		Univariate Associations		Fully Adjusted Associations <sup>†</sup>	
	n	% (SE)	cOR (95% CI)	P	aOR (95% CI)	P
Work-related characteristics						
Job position						
Administrative	675	57.69 (1.44)	1	—	1	—
Production	229	74.11 (2.49)	2.10 (1.59–2.78)	<0.001	1.08 (0.73–1.60)	0.694
Sales, logistics, or external job	195	68.42 (2.75)	1.59 (1.21–2.09)	0.001	1.50 (1.10–2.06)	0.012
Cleaning, maintenance, or security teams	53	85.48 (4.47)	4.32 (2.11–8.84)	<0.001	2.08 (0.92–4.71)	0.077
Other position	188	63.51 (2.80)	1.28 (0.98–1.66)	0.069	1.13 (0.83–1.53)	0.447
Current work situation						
Full-time in company	493	74.81 (1.69)	1	—	1	—
Hybrid work model <sup>‡</sup>	269	60.04 (2.31)	0.51 (0.39–0.66)	<0.001	0.67 (0.48–0.94)	0.019
Working exclusively from home	575	57.16 (1.56)	0.45 (0.36–0.56)	<0.001	0.64 (0.46–0.88)	0.006
On temporary leave	3	33.33 (15.71)	0.17 (0.04–0.68)	0.012	0.17 (0.04–0.74)	0.018

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Goodness of fit of the fully adjusted final model: Hosmer-Lemeshow  $\chi^2$  test = 14.80;  $P = 0.0631$ .

\*WHO-5 score  $\geq 13$ .

<sup>†</sup>Model including all predictors: work-related characteristics, sociodemographic characteristics, personal health status, and health status of family members, friends, coworkers, and supervisors.

<sup>‡</sup>A mixture of in-company and remote work.

n, Absolute frequency; %, proportion; SE, standard error; cOR, crude odds ratio; aOR, adjusted odds ratio; 95% CI, 95% confidence interval.

**TABLE 3.** Distribution of Adequate Well-being According to Sociodemographic Characteristics, and Corresponding Univariate and Fully Adjusted Multivariate Associations

Brazilian Industry Workers' Characteristics	Adequate Well-being* in the Previous 2 wk					
	Distribution		Univariate Associations		Fully Adjusted Associations <sup>†</sup>	
	n	% (SE)	cOR (95% CI)	P	aOR (95% CI)	P
Sociodemographic characteristics						
Sex						
Male	673	71.44 (1.47)	1	—	1	—
Female	667	56.53 (1.44)	0.52 (0.43–0.62)	<0.001	0.59 (0.48–0.74)	<0.001
Age, y						
<30	231	53.72 (2.40)	1	—	1	—
30–39	471	60.46 (1.75)	1.32 (1.04–1.67)	0.023	1.37 (0.99–1.90)	0.056
40–49	449	67.32 (1.82)	1.77 (1.38–2.28)	<0.001	1.76 (1.20–2.58)	0.003
≥50	184	76.67 (2.73)	2.83 (1.99–4.03)	<0.001	2.80 (1.75–4.50)	<0.001
Education level						
High school or less	202	78.29 (2.57)	1	—	1	—
College or university	547	59.07 (1.62)	0.40 (0.29–0.55)	<0.001	0.74 (0.49–1.10)	0.132
Postgraduate	591	63.01 (1.58)	0.47 (0.34–0.65)	<0.001	0.85 (0.55–1.31)	0.462
Marital status						
Never married	337	57.12 (2.04)	1	—	1	—
Married or cohabiting	907	65.35 (1.28)	1.42 (1.16–1.72)	0.001	1.08 (0.62–1.90)	0.780
Previously married <sup>‡</sup>	96	66.67 (3.93)	1.50 (1.02–2.20)	0.037	0.87 (0.47–1.60)	0.650
Having offspring						
No	542	57.48 (1.61)	1	—	1	—
Yes	798	67.68 (1.36)	1.55 (1.30–1.85)	<0.001	1.10 (0.78–1.55)	0.579
Living arrangements						
Living with a partner or spouse	420	64.02 (1.87)	1	—	1	—
Living with a partner or spouse and children	458	66.38 (1.80)	1.11 (0.89–1.39)	0.365	1.05 (0.77–1.44)	0.755
Living with a partner or spouse and parents	6	40.00 (12.65)	0.37 (0.14–1.06)	0.066	0.47 (0.15–1.50)	0.202
Living with a partner or spouse, children, and parents	10	52.63 (11.65)	0.62 (0.25–1.56)	0.313	0.80 (0.30–2.13)	0.658
Living with children	94	69.12 (3.96)	1.26 (0.84–1.87)	0.258	1.36 (0.73–2.53)	0.331
Living with parents	182	57.05 (2.77)	0.75 (0.57–0.98)	0.036	1.33 (0.73–2.43)	0.348
Living with children and parents	4	66.67 (19.24)	1.12 (0.20–6.18)	0.893	1.62 (0.26–10.21)	0.606
Living with other relatives	28	63.64 (7.25)	0.98 (0.52–1.85)	0.959	1.15 (0.50–2.64)	0.743
Living with friends or coworkers	15	41.67 (8.22)	0.40 (0.20–0.79)	0.009	0.63 (0.26–1.52)	0.301
Living alone	123	61.19 (3.44)	0.89 (0.64–1.23)	0.466	Omitted because of collinearity	

\*The Well-being of Brazilian Industry Workers on Returning to the Physical Workplace during the COVID-19 Pandemic,” Brazil, 2021 (N = 2,241).

Goodness of fit of the fully adjusted final model: Hosmer-Lemeshow  $\chi^2$  test = 14.80; P = 0.0631.

\*WHO-5 score ≥13.

<sup>†</sup>Model including all predictors: work-related characteristics, sociodemographic characteristics, personal health status, and health status of family members, friends, coworkers, and supervisors.

<sup>‡</sup>Separated, divorced, or widowed.

n, Absolute frequency; %, proportion; SE, standard error; cOR, crude odds ratio; aOR, adjusted odds ratio; 95% CI, 95% confidence interval.

lived with their parents or other relatives, compared with workers living with a partner or spouse, had decreased chance of adequate well-being (cOR, 0.75 [P = 0.036] and 0.40 [P = 0.009], respectively).

However, education level, marital status, having offspring, or living arrangements were not significantly associated with adequate well-being in the fully adjusted model.

Finally, having any diagnosed comorbidity or living with someone with any such condition remained associated with decreased odds of well-being with the adjustment of all other variables (aOR, 0.56 [P < 0.001] and 0.77 [P = 0.019], respectively).

On the other hand, subjective well-being was not associated with either a personal history of COVID-19 or the worker's vaccination status in the fully adjusted model. Likewise, well-being was not predicted by the vaccination status of those living with the worker or a history of death from COVID-19 among workers' acquaintances (Table 4).

### DISCUSSION

This study provides information on the well-being of Brazilian industry workers at a time when businesses were preparing to regain their full operations. The main finding of our study is that 63.15% of the participants presented adequate subjective well-being.

This estimate is higher than that observed by Ogata et al<sup>60</sup> in their study with a sample of Brazilian employees working from home assessed with the same instrument, the WHO-5 (63.15% vs 54.37%, respectively). One possible explanation for this difference is that our sample included employees working in different modalities. In our study, if we focus on those working remotely, the prevalence of subjective well-being was 57.16%, close to the findings of Ogata et al.

Furthermore, compared with the study by Roldán-Merino et al,<sup>61</sup> which examined a sample of nursing students using the WHO-5 in 2020, our findings revealed higher levels of well-being. The disparities may be attributed to the timing of the surveys as well as the critical exposure of frontline health care professionals during the first months of COVID-19 pandemic.

Another major goal of our study was to examine the association of psychological well-being during COVID-19 pandemic with sociodemographic variables, work-related characteristics, personal health status, and the health status of worker's family members, friends, coworkers, and supervisors.

According to our findings, women had significantly lower odds of adequate well-being, which is consistent with the findings from several studies from other countries.<sup>62–65</sup> Literature offers some explanation for this gender difference. Women have higher prevalence of internalizing

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The COVID-19 experience has demonstrated that integrated and adaptable organizational plans are required to protect workers' health and well-being.<sup>72,73</sup>

Integrated and adaptable organizational well-being and mental health policies and practices<sup>74</sup> must include therapeutic interventions, preventive efforts, and well-being and mental health promotion strategies. Moreover, they must involve employees, supervisors, leaders, occupational medicine and human resources staff, and c-level executives, ie., "Chief", high rank, senior executives who play a strategic role in the organization.

As indicated by our study, some groups of workers present increased odds of poor well-being during this transition phase of the pandemic and may possibly be at increased risk even in the postpandemic period.<sup>75</sup> In this sense, programs must give initial priority to women, younger workers, those working exclusively from home or on a hybrid model, and workers with a chronic disease or living with someone with any comorbidity. They must have their well-being and mental health evaluated and, if needed, must be referred for a therapeutic initiative. But this is not enough. Ideally, all workers must have their well-being and mental health routinely monitored and also be referred for treatment if needed.

The integrated plan must also include prevention efforts directed to at-risk individuals. Moreover, organizational policies and practices<sup>74</sup> also need to include prevention strategies for workers who are exposed to risk factors, but who do not exhibit yet compromised well-being or mental disorders.

Finally, well-being and mental health promotion strategies must be part of these policies, plans, and practices and can be directed to every worker, regardless of their well-being and/or mental health status.

In this sense, some guidelines<sup>76,77</sup> regarding mental health and well-being at work offer state-of-the-science guidance on how to implement and conduct such integrated and adaptable policies, plans, and strategies.

According to the Surgeon General's Framework for Workplace Mental Health and Well-being,<sup>77</sup> the most important asset in any organization is its people, and the well-being of workers is connected with the health of organizations.

As a result, both workers and companies may benefit from integrated health initiatives<sup>73</sup> because employees with compromised well-being are at risk of decreased productivity due to the correlation of reduced well-being with absenteeism and presenteeism.<sup>78</sup>

## CONCLUSIONS

The current study advances understanding of how the COVID-19 crisis has affected the psychological well-being of Brazilian workers when employers were planning to return to the physical workplace. Predictors of worse psychological well-being could be identified: being women, younger workers, working remotely or on a hybrid working model, and having comorbid conditions or living with someone with any comorbidity. Our findings may help occupational health specialists to support organizations in creating strategies to promote well-being on the return to the physical workplace in the transition to the "postpandemic" era.

## ACKNOWLEDGMENTS

The authors thank the Brazilian National Confederation of Industry for announcing this research project among their members. This support was crucial for the recruitment of participating companies. They also thank them for their efforts in communicating the study among their employees and encouraging their voluntary and anonymous participation. They particularly like to thank Andressa Kutschenko Nahas for her significant support on data curation and statistical analysis.

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