


## ORIGINAL ARTICLE

# Initial impact of the COVID-19 pandemic on time Japanese nursing faculty devote to research: Cross-sectional survey

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## Abstract

**Aim:** To investigate how nursing faculties' perceived time devoted to research changed during the first wave of the pandemic in Japan (April–June 2020) compared to pre-pandemic.

**Methods:** This cross-sectional study was conducted online from July 1 to August 10, 2020 and involved 1,023 nursing faculties in Japan. Participants were asked to respond to a questionnaire based on their experiences from April to June 2020. We calculated descriptive statistics for several measures and examined associations between professional/personal demographic factors and declines in overall research time.

**Results:** Of the 1,023 participants, 71.1% were spending less time on overall research activity; 79.6% spent less time attending academic events/conferences, and 77.4% spent less time conducting experiments/surveys. In contrast, 81.2% spent more time teaching, a much greater proportion than the global scientific community in a previous survey. As for work time allocation during the pandemic, teaching was by far the one activity that participants spent the most time on. Logistic regression analysis revealed that declines in overall research time were associated with several professional demographic factors, such as type of university, current academic position, and acquisition status of Japan's major research grant (*KAKENHI*) (all  $p < .05$ ).

**Conclusions:** Nursing faculties in Japan clearly spent less time on research, and more time on teaching during the first wave of the pandemic compared to pre-pandemic. The initial impact of the pandemic on nursing faculties revealed

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through this study is an eye-opener and a start for addressing the long-term impact on the nursing scientific community.

#### KEYWORDS

COVID-19, cross-sectional studies, faculty, nursing, Japan, universities

## 1 | INTRODUCTION

On March 11, 2020, the World Health Organization (WHO) declared the coronavirus disease 2019 (COVID-19) outbreak as a global pandemic, and many countries were called on to take immediate action in order to deter the spread of the virus. In Japan, the government declared an initial state of emergency in seven major prefectures in early April 2020, and it was later expanded to cover all 47 prefectures until it was lifted in late May. While many countries had strict lockdown regulations with penalties for violations, Japan was in a “mildly enforceable lockdown (mild-lockdown)” during this first wave of the pandemic; residents were only requested to take preventive actions, including social-distancing measures. However, many companies, universities, and other institutions followed this request and took immediate measures to prevent more widespread infection, including the closure of institutions/buildings. Although different countries around the world have implemented a variety of social protection measures, this health crisis has clearly evolved into an economic, educational, cultural, and social crisis worldwide, which has caused a significant increase in psychological distress among the general population and healthcare workers (Chew, Lee, et al., 2020; Chew, Ngiam, et al., 2020; Gan et al., 2020; Qiu et al., 2020; Wang et al., 2020).

Globally, emphasis has been put on social and economic measures and on increasing the capacity of healthcare services to meet the demands of people infected with COVID-19 (Cipriano, Boston-Leary, McMillan, & Peterson, 2020; Turale, Meechamnan, & Kunaviktikul, 2020). As the largest professional group in the global health workforce, many nurses are on the frontlines of the pandemic, battling the health crisis in hospitals as well as in communities. Under these circumstances, much attention has been put on front-line nurses (e.g., psychological impact on nurses) (Labrague & De Los Santos, 2020), but less attention has been given to nursing faculties in which work has also possibly been disrupted by the pandemic. Shedding more light on this population is crucial because nurse scientists have been actively engaged in executing/shaping the research agenda and consistently improving patient care and outcomes throughout world history's daunting times (Nejatian, 2020).

In mid-March 2020, one of the earliest surveys investigated how the pandemic had impacted the global scientific

community (ResearchGate, 2020). Based on data from international scientists from different research fields, 82% of respondents reported that their research work has been affected; 86% spent less time attending research-related events/conferences; and 52% spent less time doing experiments. On the other hand, 61% spent less time teaching, and nearly half of the scientists spent more time researching and writing research papers. Although the survey period (mid-March) was during a transition phase, with many scientists still dealing with remote work and balancing their personal and professional lives in new ways, this report suggested that scientists might have found an alternative scientific activity to help them remain productive. However, another study group conducted a more in-depth survey in mid-April, and found that the pandemic has affected scientists in different ways – different research fields and different individual demographic backgrounds were differently affected (Myers et al., 2020). More specifically, scientists working in the field of bench sciences (e.g., biological sciences), female scientists, and those with young children experienced substantial declines in the time they devoted to research. Given the heterogeneous effects of the pandemic, in order to mitigate the impact of the pandemic on the scientific community, policymakers, academic societies, and institutional leaders need to gain more detailed insights into the extent of disruptions that scientists in each field are facing and then take targeted and nuanced approaches. However, there is no available data on the nature and magnitude of COVID-19 related disruptions experienced by nurse scientists.

The Japan Academy of Nursing Science (JANS) has therefore launched an ad hoc committee, the COVID-19 Nursing Research Countermeasures Committee, to specifically deal with nursing research appropriate to a society that has changed dramatically due to the pandemic. As JANS is now the biggest nursing academic society in Japan, the Academy is uniquely positioned to analyze the impact of the pandemic on nurse scientists at the national level. To gain an in-depth insight into the extent of disruptions nurse scientists are facing, the JANS ad hoc Committee decided to conduct an initial comprehensive online survey (JANS, 2020). In particular, we wanted to know how COVID-19 and social-distancing measures during the first wave and mild-lockdown phases in Japan (April–June 2020) impacted research and related activities (e.g., changes in time devoted to each activity), what

specific barriers to conducting research have been experienced, and what support from JANS was expected.

Motivated by the earliest report given from ResearchGate (2020), this study initially targeted and extracted a sub-group of full-time nursing faculties from the total sample collected, and investigated how their perceived time devoted to research and related activities changed during the first wave and mild-lockdown phases in Japan (April–June 2020). This study also investigated what professional/personal demographic factors were associated with declines in research time during the pandemic. All data and results of the analysis presented here are part of the original survey data collected by the ad hoc Committee (JANS, 2020). Other data obtained through the original survey (e.g., perceived barriers to conducting research, and expected support from JANS) will be separately analyzed and reported elsewhere.

## 2 | METHODS

### 2.1 | Research design, participants, and data collection

This study employed a cross-sectional research design, and adheres to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. The study was conducted in accordance with the Declaration of Helsinki. The study protocol was reviewed and approved by the Ethics Committee of the University of Miyazaki (approval number: O-0733). All participants provided informed consent by ticking a checkbox before starting the online survey.

As briefly stated, the data for this study were taken from the original survey conducted by the JANS ad hoc Committee. The original survey was conducted online between July 1 and August 10, 2020. We sent an email invitation with a link to the survey to 9,447 members of JANS who had registered their email addresses with the Academy, and also posted a survey announcement on the Academy's website (there were 9,524 JANS members as of the survey period).

The inclusion criterion for the present study was full-time employment as a faculty member in a university with a nursing program. The original survey was completed by 1,532 participants in total (response rate = 16.1%), and we extracted sub-group data from 1,023 (66.8%) of those participants who met the criterion for this study.

### 2.2 | Measures

Participants were asked to respond to the researcher-designed survey questionnaire based on their experience

in the previous 3 months (April–June 2020). Details of the measures and information used in this study are described below (please also see the ad hoc Committee homepage [JANS, 2020] for the full version of the questionnaire).

#### 2.2.1 | Changes in time devoted to research and related activities

This category includes measures for how participants' time devoted to research and related activities changed compared to pre-pandemic (one item for overall research activity, and 10 other items for more detailed research and related activities). The following 10 detailed items were set based on the previous survey (ResearchGate, 2020): literature search, writing papers, writing grants, career opportunities, experiments, lab management, collaborating with other scientists, purchasing lab equipment, attending conferences, and teaching. Each item could be answered by one of the following five responses: “much less,” “less,” “about the same,” “more,” and “much more.”

#### 2.2.2 | Allocation of work time during the pandemic

This category measured the percentage of work time participants spent on the following tasks from April to June 2020: research, teaching, administration, social contributions, clinical practice, and other work activities. These categories are based on those used in Japan for evaluating faculty members' work time allocation in the healthcare field.

#### 2.2.3 | Professional and personal demographic characteristics

The following professional and personal demographic information was collected. Professional information included type of university, current position, academic degree, and acquisition of *KAKENHI* (the major public competitive grant program for scientific research in Japan) as a principal investigator. All nursing faculties in Japan can apply for *KAKENHI* regardless of their academic position or the type of university they are working at (i.e., all of the participants in the study were allowed to engage in scientific research). Personal information included gender, age, presence of cohabitant(s), involvement in childcare, involvement in care-giving for older adults/other family, and place of residence.

TABLE 1 Demographics of participants (N = 1,023)

Variables	n	(%)
Professional demographics		
Type of university		
National university	210	(20.5)
Prefectural/municipal university	261	(25.5)
Private university	552	(54.0)
Current position		
Professor	353	(34.5)
Associate professor/lecturer	442	(43.2)
Assistant professor/teaching associate	228	(22.3)
Academic degree		
Doctoral	575	(56.2)
Masters	428	(41.8)
Other	15	(1.5)
Prefer not to say/missing	5	(0.5)
Acquisition of <i>KAKENHI</i> <sup>a</sup> as a PI		
Yes	529	(51.7)
No	476	(46.5)
Prefer not to say/missing	18	(1.8)
Personal demographics		
Gender		
Female	919	(89.8)
Male	89	(8.7)
Prefer not to say/missing	15	(1.5)
Age		
–25	0	(0.0)
26–35	63	(6.2)
36–45	269	(26.3)
46–55	379	(37.0)
56–65	274	(26.8)
66–	34	(3.3)
Prefer not to say/missing	4	(0.4)
Presence of cohabitant		
Yes	610	(59.6)
No	363	(35.5)
Prefer not to say/missing	50	(4.9)
Involvement in childcare		
Yes	363	(35.5)
No	623	(60.9)
Prefer not to say/missing	37	(3.6)
Involvement in care-giving for older adults/others		
Yes	164	(16.0)
No	818	(80.0)

TABLE 1 (Continued)

Variables	n	(%)
Prefer not to say/missing	41	(4.0)
Place of residence		
Special alert prefectures <sup>b</sup>	644	(63.0)
Other prefectures	371	(36.3)
Prefer not to say/missing	8	(0.8)

Abbreviation: PI, principal investigator.

<sup>a</sup>*KAKENHI* (Grant-in-Aid for Scientific Research) is the major public competitive grant program for scientific research in Japan.

<sup>b</sup>The Japanese government designated 13 prefectures (Hokkaido, Ibaraki, Tokyo, Kanagawa, Saitama, Chiba, Ishikawa, Gifu, Osaka, Aichi, Kyoto, Hyogo, and Fukuoka) as “special alert prefectures”

## 2.3 | Data analysis

We calculated descriptive statistics on all the above variables. To examine the association between professional/personal demographic factors and declines in overall research time, we performed a binomial logistic regression analysis, in which “declined” in overall research time (“not declined” as a reference) was considered to be the dependent variable and all categorical demographic variables were considered independent variables. Data were analyzed using JMP Pro 14.0 (SAS Institute Inc., Cary, NC, USA), and statistical significance was assessed using the .05 level of significance.

## 3 | RESULTS

### 3.1 | Demographic characteristics

Of the 1,023 participants, the majority (54.0%) worked at private universities; 25.5% worked at prefectural/municipal universities; and 20.5% at national universities. Distribution of currently held positions was as follows: professor (34.5%), associate professor/lecturer (43.2%), and assistant professor/teaching associate (22.3%). The highest academic degree participants had was either a doctoral or master's degree (56.2% and 41.8%, respectively). Nearly half of participants acquired *KAKENHI* as a principal investigator during the study period.

Regarding personal demographic characteristics, the majority (89.8%) of participants were female. Most participants fell into the following age groups: 36–45 years (26.3%), 46–55 years (37.0%), and 56–65 years (26.8%). In addition, 59.6% of participants cohabitated with either a spouse or life partner, 35.5% were involved in childcare, and 16.0% were involved in care-giving for older adults or other family members. Under a declared initial state of

emergency in Japan (April to May), the government designated 13 prefectures as “special alert prefectures” based on several criteria (e.g., a cumulative number of confirmed cases  $\geq 400$ ), and 63.0% of participants lived in these prefectures. See Table 1 for more details.

### 3.2 | Changes in time devoted to research and related activities

As shown in Figure 1, 71.1% of participants reported they were spending less time (responded “much less” or “less”) on overall research activity compared to pre-pandemic. Going into more detailed activities, the majority of participants (79.6%) spent less time attending academic events/conferences, and 77.4% spent less time conducting experiments/surveys. There was also a decline in time spent on activities which typically can be done remotely, such as writing papers (53.6%), writing grants (43.9%), and literature search (41.2%). In contrast, 81.2% of participants reported that they were spending more time teaching (responded “much more” or “more”).

### 3.3 | The association of professional/personal demographic factors and declines in overall research time

Several professional demographic factors were found to be associated with declines in overall research time (Tables 2 and 3). Compared with participants who worked at national universities, those who worked at private universities had a 1.6-fold higher relative likelihood of reporting declines in overall research time (odds ratio 1.63, 95% CI [1.08, 2.45]). Compared with assistant professors/teaching associates, professors and associate professors/

lecturers were more likely to report declines in overall research time (odds ratio 1.83, 95% CI [1.07, 3.13]; 1.77, 95% CI [1.17, 2.68], respectively). Participants who acquired *KAKENHI* as a principal investigator were 1.5 times more likely to report overall research time declining (odds ratio 1.45, 95% CI [1.05, 2.01]). Other professional and personal demographic factors were not significantly associated with declines in time devoted to overall research.

### 3.4 | Allocation of work time during the pandemic

Overall, during the pandemic, teaching was by far the one activity that participants spent the most time on; other major time allocations were in administration and research (Figure 2). Teaching took up the majority of time for all positions at all types of universities, whether or not there was a *KAKENHI* acquisition. However, there were slight differences in each category: (a) participants who worked at national universities allocated more time on research and less time on administration, and those who worked at private universities allocated more time on teaching than those in other types of universities; (b) professors spent more time on administration than those in other positions, associate professors/lecturers spent more time on teaching, and assistant professors/teaching associates spent more time on research; and (c) there is no clear difference in work time allocation whether or not *KAKENHI* was acquired.

## 4 | DISCUSSION

This is the first study providing initial quantitative evidence of how the COVID-19 pandemic has severely

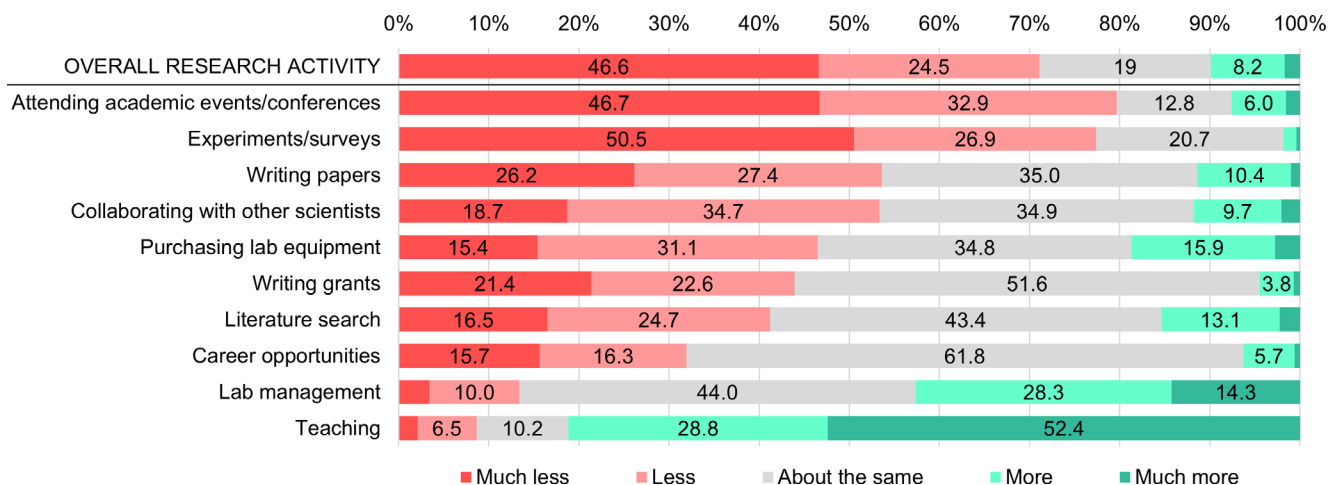


FIGURE 1 Changes in time spent on research and related activities compared to pre-pandemic ( $N = 1,023$ )

Variables	Declined <sup>a</sup>		Not declined <sup>a</sup>	
	<i>n</i>	(%)	<i>n</i>	(%)
Type of university ( <i>n</i> = 1,020)				
National university [reference] ( <i>n</i> = 209)	135	(18.6)	74	(25.1)
Prefectural/municipal university ( <i>n</i> = 253)	179	(24.7)	82	(27.8)
Private university ( <i>n</i> = 550)	411	(56.7)	139	(47.1)
Current position ( <i>n</i> = 1,020)				
Assistant prof/teaching associate [reference] ( <i>n</i> = 227)	133	(18.3)	94	(31.9)
Professor ( <i>n</i> = 352)	269	(37.1)	83	(28.1)
Associate prof/lecturer ( <i>n</i> = 441)	323	(44.6)	118	(40.0)
Academic degree ( <i>n</i> = 1,015)				
Masters or less [reference] ( <i>n</i> = 442)	296	(41.0)	146	(49.8)
Doctoral ( <i>n</i> = 573)	426	(59.0)	147	(50.2)
Acquisition of <i>KAKENHI</i> <sup>b</sup> as a PI ( <i>n</i> = 1,003)				
No [reference] ( <i>n</i> = 475)	321	(45.0)	154	(53.3)
Yes ( <i>n</i> = 528)	393	(55.0)	135	(46.7)
Gender ( <i>n</i> = 1,005)				
Male [reference] ( <i>n</i> = 89)	58	(8.1)	31	(10.7)
Female ( <i>n</i> = 916)	657	(91.9)	259	(89.3)
Age ( <i>n</i> = 1,016)				
Aged ≤45 [reference] ( <i>n</i> = 331)	217	(30.1)	114	(38.6)
Aged >45 ( <i>n</i> = 685)	504	(69.9)	181	(61.4)
Presence of cohabitant(s) ( <i>n</i> = 970)				
No [reference] ( <i>n</i> = 362)	262	(38.0)	100	(35.6)
Yes ( <i>n</i> = 608)	427	(62.0)	181	(64.4)
Involvement in childcare ( <i>n</i> = 983)				
No [reference] ( <i>n</i> = 621)	448	(64.1)	173	(60.9)
Yes ( <i>n</i> = 362)	251	(35.9)	111	(39.1)
Involvement in care-giving for older adults/others ( <i>n</i> = 979)				
No [reference] ( <i>n</i> = 817)	577	(82.5)	240	(85.7)
Yes ( <i>n</i> = 162)	122	(17.5)	40	(14.3)
Place of residence ( <i>n</i> = 1,013)				
Other prefectures [reference] ( <i>n</i> = 370)	257	(35.8)	113	(38.3)
Special alert prefectures <sup>c</sup> ( <i>n</i> = 643)	461	(64.2)	182	(61.7)

Abbreviations: PI, principal investigator.

<sup>a</sup>Responses “much less” and “less” were labeled as “declined,” and responses “about the same,” “more,” and “much more” were labeled as “not declined.”

<sup>b</sup>*KAKENHI* is the major public competitive grant program for scientific research in Japan.

<sup>c</sup>The Japanese government designated 13 prefectures (Hokkaido, Ibaraki, Tokyo, Kanagawa, Saitama,

Chiba, Ishikawa, Gifu, Osaka, Aichi, Kyoto, Hyogo, and Fukuoka) as “special alert prefectures.”

**TABLE 2** Distribution of participants who reported “declined” versus “not declined” in overall research time by professional/personal demographic variables (*N* = 1,023)

affected the time nursing faculties devote to research activities, and also highlighting how those with different professional backgrounds were differently affected.

One key finding is that, compared to pre-pandemic, nursing faculties clearly spent less time on research

activities, even those activities which typically can be done remotely (e.g., searching and writing papers). There were two major activities in which nearly 80% of participants reported declines in the time they could devote to them – attending academic events/conferences and

**TABLE 3** Professional and personal demographic factors associated with declines in overall research time ( $N = 1,023$ )

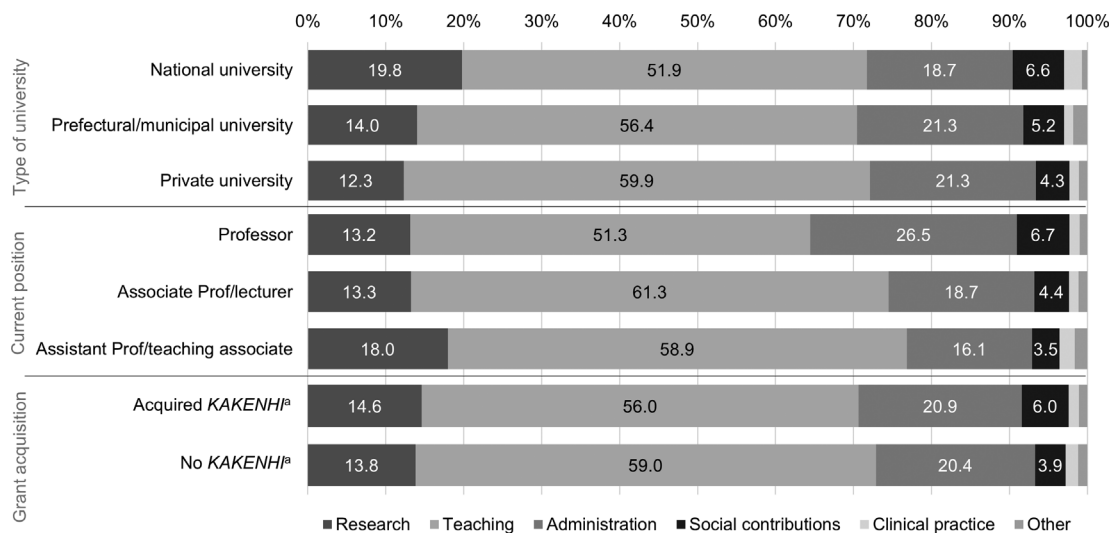
Variables	OR	95% CI	p value
<b>Professional demographics</b>			
Type of university (vs. national university)			
Prefectural/municipal university	1.154	0.75–1.78	.515
Private university	1.630	1.08–2.45	.019*
Current position (vs. assistant prof/teaching associate)			
Professor	1.827	1.07–3.13	.028*
Associate prof/lecturer	1.767	1.17–2.68	.007*
Academic degree (vs. Masters or less)			
Doctoral	1.094	0.75–1.59	.639
Acquisition of <i>KAKENHI</i> <sup>a</sup> as a PI (vs. no)			
Yes	1.453	1.05–2.01	.025*
<b>Personal demographics</b>			
Gender (vs. male)			
Female	1.089	0.66–1.81	.742
Age (vs. aged ≤45)			
Aged >45	1.042	0.71–1.54	.837
Presence of cohabitant(s) (vs. no)			
Yes	0.860	0.61–1.21	.381
Involvement in childcare (vs. no)			
Yes	0.955	0.68–1.35	.792
Involvement in care-giving for older adults/others (vs. no)			
Yes	1.122	0.73–1.72	.596
Place of residence (vs. other prefectures)			
Special alert prefectures <sup>b</sup>	1.055	0.77–1.45	.740

Abbreviations: CI, confidence interval; OR, odds ratio; PI, principal investigator.

<sup>a</sup>*KAKENHI* (Grant-in-Aid for Scientific Research) is the major public competitive grant program for scientific research in Japan.

<sup>b</sup>The Japanese government designated 13 prefectures (Hokkaido, Ibaraki, Tokyo, Kanagawa, Saitama, Chiba, Ishikawa, Gifu, Osaka, Aichi, Kyoto, Hyogo, and Fukuoka) as “special alert prefectures.”

\* $p < .05$ .



**FIGURE 2** Allocation of work time by professional demographics during the pandemic ( $N = 1,023$ ). <sup>a</sup>*KAKENHI* is the major public competitive grant program for scientific research in Japan

conducting experiments/surveys. When compared to the previous survey which targeted the global scientific research population (ResearchGate, 2020), there is almost no difference regarding declines in time attending academic events/conferences (80% [our survey] vs. 86% [ResearchGate]), but regarding declines in time conducting experiments/surveys, nursing faculties were impacted more severely (77% vs. 52%). There are two possible reasons for this – the nature of nursing research and increased teaching workload in nursing faculties.

As nursing research is a practice-based science and nursing itself is influenced by patient-centered, holistic, and humanistic values, nursing faculties often require fieldwork needing physical contact with patients to conduct their research (e.g., Clissett, 2008). This possibly makes nursing research vulnerable to the negative effects of the pandemic.

Several studies have suggested the greater time spent on teaching, the lesser research productivity (e.g., Smeltzer et al., 2016). So, increased teaching time observed in this study may also have affected declines in time participants devoted to research activities. A far greater proportion (81%) of nursing faculties experienced increased teaching time compared to the global scientific community (only 18%) (ResearchGate, 2020). Even before the pandemic, teaching was always generally the largest component of nursing faculty workload around the world (Ellis, 2013). This is especially true in Japan because there is neither a clear category of university research nor a research track system as seen in other countries; so, nursing faculties in Japan are generally equally responsible for research, graduate nursing education, and pre-license nursing education (Arimoto, Gregg, Nagata, Miki, & Murashima, 2012; Turale, Ito, Murakami, & Nakao, 2009). Like many countries in the world, Japan is experiencing a nursing shortage that puts pressure on universities to produce more nurses (Tsuji, 2007). This is especially crucial in the present healthcare crisis and will also be in the future; nursing faculties around the world have been struggling to maintain teaching quality within social-distancing guidelines (Agu, Stewart, McFarlane-Stewart, & Rae, 2021; Lazenby et al., 2020). Regarding clinical training courses for final-year undergraduate students in Japan, only 2% of courses could be carried out as planned between April and July 2020 (Japan Association of Nursing Programs in Universities, 2020). Taken together, during the first wave of the pandemic in Japan, nursing faculties prioritized and dealt with maintaining the quality of teaching. Such efforts will undoubtedly contribute to our future society and healthcare services, but may affect production in nursing research in an indirect way.

Declines in overall research time were associated with three professional demographic factors. The first factor is

the type of university. Nursing faculties working at private universities allocated more time to teaching during the pandemic than those in national universities, which possibly led to declined research time. Differing general features between private and national universities in Japan also tend to support this. For example, the proportion of graduate schools among private universities (46%) is much smaller than that among other universities (98% [national], 94% [prefectural/municipal]) (Japan Association of Nursing Programs in Universities, 2019). Furthermore, a previous survey with young Japanese nursing faculties reported that nursing faculties working at national universities published more research articles than those working at a private university (Oyama et al., 2015). Such factors may reflect private universities' general focus on pre-license nursing education, in which faculties in private universities have been forced to spend even more time on teaching and thus less time on research during the pandemic.

The second factor is current academic position. Even before the pandemic, global nursing faculties experienced high workloads (e.g., increasing nursing programs, time-consuming clinical supervision of undergraduate students, long meetings, faculty shortages) (Roberts & Turnbull, 2004); such workloads are more severe during the pandemic. In addition to devising alternative teaching methods, nursing faculties have been burdened with additional workload: students need more assistance; faculty leaders have to reinvent how to run their faculty operations; staff face unprecedented challenges (including job insecurity). In these circumstances, higher-positioned nursing faculties had to allocate more time to non-research duties; professors spent more time on administration, associate professors/lecturers spent more time on teaching than those in other positions.

The last factor is the status of research grants. There are several indicators to measure productivity or activity in research, and the number of publications produced and the status of external research grants (among others) are commonly used (e.g., Smeltzer et al., 2016). As stated above, nursing research is a practice-based science, and often requires fieldwork (i.e., such research sometimes can only be done in situ). Generally, this type of research is costly and time-consuming; so *KAKENHI* is one of the best grants for Japanese nursing researchers in terms of its larger grant size and longer period (many of the other private grants/funds cover short-term research projects [e.g., 1 year]). Although nursing faculties that acquire *KAKENHI* are considered to be more active in research than those that do not, there was almost no difference in allocated time devoted to research during the first wave of the pandemic regardless of whether or not *KAKENHI* was acquired. Thus, nursing faculties generally more



active in research may have been significantly affected by the pandemic. In Japan, even if researchers acquire *KAKENHI*, there is no salary incentive and they still have the same responsibilities/duties with respect to administration and/or education in their universities. However, in recent years, several Japanese universities have started to apply a performance-linked salary system and *KAKENHI* allows researchers a teaching buyout (e.g., they can allocate research funds to hiring teaching/administrative assistants [outsourcing non-research work]); so, if such systems become common in the scientific community in Japan, this situation may be improved.

Our study focusing on Japanese nursing faculties did not detect any personal demographic factors associated with declines in research time. In contrast, the previous study (Myers et al., 2020) on the Western scientific community demonstrated that female scientists and those with young children reported a substantial decline in research time during the pandemic. Traditionally, there is thought to be a gender gap with respect to research productivity or faculty workload, and this academic gender gap is often explained by reference to familial status and responsibilities (e.g., Ledin, Bornmann, Gannon, & Wallon, 2007; Symonds, Gemmell, Braisher, Gorringer, & Elgar, 2006). However, with today's growing emphasis on gender equality around the world, dependents at home needing care and home management responsibilities present work-related conflicts for both male and female scientists. Such complex and multifaceted situations also appeared in our survey population, in which 66% of male respondents were involved in childcare compared to 34% of female respondents. On the other hand, 17% of female respondents were involved in care-giving for older adults or other family members compared to 8% of male respondents. Thus, the results of this study suggest gendered variables are not a central explanatory framework for describing the factors associated with declines in research time during the pandemic. Nevertheless, previous studies on whether gender disparities in research productivity in the scientific community are present have yielded mixed results (Aiston & Jung, 2015; Eloy et al., 2013; van den Besselaar & Sandström, 2016), so it will be important to track the impact of the COVID-19 pandemic on gender and other related variables among nurse faculties with more detailed investigation.

However, our study did not detect any personal demographic factors associated with declines in research time. Thus, the results of this study suggest that, for nursing faculties in Japan, gendered variables are not a central explanatory framework for describing the factors associated with declines in research time during the pandemic.

The following limitations must be taken into consideration when interpreting these findings. First, our study

sample was based on nursing faculties in Japan; thus, our study is by no means a complete or exhaustive analysis of the impact of the COVID-19 pandemic on nursing faculties. However, it does provide an initial analysis of how the pandemic is impacting the nursing scientific community. Second, only 16% of JANS members we reached responded to the original survey; so, generalizability to Japanese nursing faculties should also be carefully interpreted. Third, the current study asked participants to respond to the survey based on their experience from April to June 2020. Therefore, the findings of this study reflect only the initial impact of the pandemic on nursing faculties in Japan. Such an initial impact is likely to continue and even worsen in the later term as long as pandemic-related social-distancing policies continue. Finally, this study mainly focuses on how nursing faculties' perceived time devoted to research changed and what professional/personal demographic factors were associated with declines in research time during the pandemic; so we could not determine what disruptive factors/barriers to conducting research they experienced. Our further separate analyses will address this point.

As nursing faculties clearly spent less time on research, and more time on teaching compared to pre-pandemic, institutional leaders, academic societies, and policymakers should examine effective strategies to maintain quality in both research and education. Universities and the government should support higher-positioned nursing faculties by, for example, supporting faculties experiencing extra management and/or teaching tasks caused by COVID-19, and helping them to secure sufficient time for conducting their research (e.g., providing emergency subsidies for hiring new Information and Communication Technology [ICT] and/or administrative staff). WHO designated 2020 the International Year of the Nurse and the Midwife and published the State of the World's Nursing Report (WHO, 2020), describing the shortage of evidence for effective strategies in nursing intervention and emphasizing the need for more investment in nursing research. Academic societies need to strengthen and foster collaboration between nurse researchers within social-distancing guidelines; they should also lobby policymakers for investment in both nursing research and education. Such efforts will mitigate the impact of the pandemic on nurse faculties, helping them to remain productive in research, execute/shape research agendas, and improve patient care and outcomes during/after the pandemic. Although the current study focused on Japanese nursing faculties, our findings might have some lessons for nursing faculties in other countries (e.g., its practice-based science, teaching is the largest component of workload), and faculty staff in other healthcare-related fields requiring practical training

(e.g., medicine, dentistry, pharmacy, clinical psychology, occupational therapy, and physical therapy).

## 5 | CONCLUSIONS

Unlike the global scientific community, nursing faculties clearly spent less time on research, and more time on teaching compared to pre-pandemic. Furthermore, the pandemic had different effects on those with different professional backgrounds.

The initial impact of the COVID-19 pandemic on nursing faculties revealed throughout this study is an eye-opener for the world and a start for addressing the long-term impact to come on the nursing scientific community. Academic societies, universities, and policymakers should act to alleviate the decline of research time among nursing faculties caused by the pandemic.

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## CONFLICT OF INTEREST


No conflict of interest has been declared by the authors.

## AUTHOR CONTRIBUTIONS

Naoki Yoshinaga, Gojiro Nakagami, Hiroki Fukahori, Yoko Shimpuku, and Junko Sugama contributed to the conception and design of this study. Naoki Yoshinaga, Gojiro Nakagami, and Junko Sugama acquired data. Naoki Yoshinaga and Gojiro Nakagami performed the statistical analysis and drafted the manuscript. Hiroki Fukahori, Yoko Shimpuku, Hiromi Sanada, and Junko Sugama interpreted the data and critically reviewed the manuscript. Hiromi Sanada and Junko Sugama supervised the whole study process. All authors read and approved the final manuscript.

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