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Mental Health and Social Connectivity: The Positive Role of Neighborhood Interaction for International Students in Japan

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ABSTRACT

The Japanese government aims to increase the number of inbound international students by 2033. International students' mental health is affected by various environmental stressors, including 'living space' which is an important but understudied element. A cross-sectional study was therefore conducted in the Greater Tokyo area through a self-administered online survey for international students, with questions regarding characteristics of living space as well as a subset of the General Health Questionnaire (GHQ-12) to assess mental health status. Data were collected from 177 international students, who were mostly postgraduate (95%), from Asia (72%), and 40% exhibited symptoms of moderate psychological distress (GHQ-12≥14 pts). A multivariable Poisson regression analysis revealed that the absence of 'socialization opportunities with nearby residents' was associated with an increased prevalence of moderate psychological distress, although notably the association was only observable for those students who had lived in Japan for more than one year (PR 1.79, $p<0.05$).

Keywords: International students, Japan, mental health, psychological distress, living space, housing, socialization

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INTRODUCTION

Driven by internationalization initiatives such as the Top Global University Project, the Japanese government has set an ambitious goal to increase the number of inbound students to 400,000 by 2033 (*Council for the Creation of Future Education*, 2023), representing an approximate 30% increase at the time of writing. This is consistent with a recent multicountry report indicating that international student mobility worldwide will continue to increase at a rate of more than 4% per year until 2030 (*The Global Economic Trends Affecting Student Mobility*, 2024). Japan now faces the challenge of supporting the mental health of an increasingly diverse student population.

University students encounter a wide range of potential stressors in their academic and personal lives, putting them at substantial risk of psychological distress. Indeed in one large multicountry study, approximately one-third of the student participants screened positive for a mental health disorder (Auerbach et al., 2018). International students (i.e., those who move to another country for the purpose of pursuing tertiary or higher education (Shapiro et al., 2014)) are particularly vulnerable, since they also face the so-called 'culture shock' of adapting to an unfamiliar environment (Mulyadi et al., 2024) and a range of additional stressors: from practical difficulties in daily living such as communication barriers (Ali et al., 2020) or financial constraints (Wilson et al., 2023), to feelings of discrimination (Maleku et al., 2022) or a lack of belonging (Yan & Pei, 2018).

One noteworthy source of stress is housing. Studies have shown that international students often struggle to find suitable accommodations (Corney et al., 2021; Obeng-Odoom, 2012), and uncomfortable living conditions have been linked to an increased risk of depressive symptoms (Abdelkader et al., 2024). Yet the question of which specific characteristics of living space have implications for international students' mental health status has not been well explored—not for the international student population in general, nor for those studying in Japan specifically.

International students in Japan can apply to live in dormitories or other styles of accommodation managed by universities, local authorities, and student support organizations. However considering the aforementioned Japanese government target to substantially increase the international student population, currently available student accommodations will face increasing strain and there will surely be demand for additional facilities. This is therefore an appropriate time to address the research gap and assess the associations between specific living space

characteristics and mental health status among international students in Japan. We hope that this study will help inform housing policy and promote psychological resilience among the growing international student population.

LITERATURE REVIEW

Housing and mental health outcomes

Although the international student context is understudied, various living space characteristics are associated with overall mental health as well as depression, stress and anxiety in other adult populations (Riva et al., 2022). For example, adequate floor space to engage in activities beneficial to residents' mental health and prevent overcrowding is associated with reduced levels of stress and anxiety (Keller et al., 2022; Chan et al., 2021). Exposure to daylight improves the perceived happiness of the home (Morales-Bravo & Navarrete-Hernandez, 2022), enhances well-being by reducing headaches and eye tension (Tabadkani et al., 2021), and normalizes circadian rhythms resulting in better sleep quality (Engineer et al., 2021). Disturbances due to nearby environmental noise can reduce the ability to relax, which results in lower well-being (Torresin et al., 2022; Li et al., 2022). Access to green space enables residents to enhance their mental health status through increased opportunities for physical and leisure activities (D'Alessandro et al., 2020) and improves their feelings of community satisfaction (Pasanen et al., 2023). There is also evidence that well-being can be improved by housing design that increases opportunities for residents to interact (Lai & Rios, 2017) and that social interactions with neighbors improve residential satisfaction (Vera-Toscano & Ateca-Amestoy, 2007).

International student housing

Regarding the international student population specifically, international students can experience stress due to difficulty in securing preferred accommodations (Kinika & Egbo, 2024; Pasanen et al., 2023), and housing unaffordability can exacerbate financial pressures (Sotomayor et al., 2022). International students also report stress due to general living conditions (Abdelkader et al., 2024), and in the Japanese context international students' dissatisfaction with housing comfortableness is associated with an increased risk of depressive symptoms (Kono et al., 2015). Living close to other students can stimulate social integration and decrease loneliness (Ziguras, 2015), and sharing accommodations has been shown to reduce the risk of depressive symptoms (Eskanadrieh et al., 2012). Yet there is also evidence to suggest that shared living arrangements can become a stressor if there are lifestyle incompatibilities or barriers to communication with other inhabitants (Kit & Goel, 2021; Newton et al., 2021). Housing insecurity and poor living conditions such as environmental noise can also impact academic performance (Hastings et al., 2024; Kit & Goel, 2021), which itself has strong implications for international student well-being (Chow, 2007).

Despite the prominent role that housing plays in international student mental health, there remains a lack of empirical studies in which housing is the primary focus or that include multiple living space characteristics in the same study. Even for the general student population such studies are limited, mostly undertaken in response to the COVID-19 crisis when students were forced to spend more time at home. Studies in this context have shown how factors such as living space size, access to outdoor and green areas, and quality of view mitigated the loneliness and stress of students during the enforced lockdown period (Amerio et al., 2020; Morganti et al., 2022).

Research gap

To our knowledge, no empirical studies have addressed the international student mental health implications of multiple specific living space characteristics. This is however an area worthy of exploration, since there is evidence to suggest that the types of stressors and degrees of association with mental health status differ even between international students and domestic students (Amanvermez et al., 2024), so it is feasible that the mental health implications of their living space characteristics may also differ. A better understanding of these implications is vital to "create an appropriate environment for accepting international students" (*Outline of the Student Exchange System*, 2008), a long-standing Japanese government target that has arguably not yet been achieved (Rees, 2024).

STUDY QUESTIONS AND THEORETICAL FRAMEWORK

Guided by the literature review and the identified research gap, this study aims to address the primary study question:

Q1) Which specific living space characteristics are associated with international student mental health status in Japan?

In addition, a tangential topic that emerged in the literature surrounding international students' well-being was the 'acculturative stress' they face when attempting to adapt to the new environment (Berry, 2006). International students can face initial fatigue due to encountering several new environmental stressors at once (Lee, 2017), although one longitudinal study showed how acculturative stress levels and adjustment difficulties measurably decreased during the course of the international students' first year in the host country (Koo et al., 2021) and a similar phenomenon has also been observed specifically in the Japanese context (Inoue & Ito, 1997). A Japanese governmental report even highlights the need to provide housing support for newer arrivals, specifying that "universities and other educational institutions should coordinate with other related agencies to provide accommodations to international students who have been in Japan for one year or less" (*Outline of the Student Exchange System*, 2008). However, to what extent housing difficulties and associated stress levels actually decrease as the student

lives more time in the host country remains a topic worthy of further exploration. Therefore, we also aim to address a secondary study question:

Q2) Do associations between living space characteristics and international student mental health status depend on the length of time lived in Japan?

As the basis for a theoretical framework for this study, we refer to the informative work of Rolfe et al. (2020), in which housing was shown to affect well-being through housing quality (via the mechanism of "comfortable, well-presented housing enables relaxation and a sense of status") and neighborhood quality and the availability of social support networks (via the mechanism of "environment and networks reduce stress and increase opportunities for socialization") (Rolfe et al., 2020). While their framework was not developed specifically for the international student population, our literature review indicates that both housing comfortableness and opportunities for socialization do indeed play significant roles in the mental health status of this population.

Although Rolfe et al. showed that housing security and tenancy experience was a third channel with implications for mental health, and we recognize that this is relevant for international students, for the purposes of this study we focus primarily on housing and neighborhood quality factors.

MATERIALS AND METHODS

Design and sample

A cross-sectional analysis was performed on data collected from a survey conducted in the Greater Tokyo area from July~September 2024, which was approved by the relevant research ethics committee (receipt number M2024-030). Greater Tokyo is a populous area comprising the Kanto region and neighboring Yamanashi prefecture, and was chosen as the study location since it is the primary destination of international students to Japan (approximately 47%) and contains 8 of the top 10 universities with the largest numbers of international students (*Result of International Student Survey in Japan*, 2023).

The participants were recruited via convenience random sampling, mainly in cooperation with two student dormitories:

a) Ichikawa International House, located in Ichikawa City, has a total of 51 rooms, managed by Tokyo Medical and Dental University, and houses students from that particular university.
b) TIEC International Residence Halls, located in Koto City, a total of 826 rooms, managed by the public student support organization JASSO, and housing students from multiple universities across Greater Tokyo.

Approximately 750 postcard-sized flyers with brief study explanations and online questionnaire link QR codes were hand posted by the researcher into all available

mailboxes of international student residents at the two dormitories indicated above. A brief study explanation and questionnaire link was also shared online via university staff to international students at dormitories operated by Tokyo Institute of Technology. Via both methods, potential participants were also encouraged to share information about the survey with their peers. The only eligibility requirements were that the participant should be an international student living in the Greater Tokyo area and be able to complete the self-administered online questionnaire in English. An a priori sample size of 148 was calculated in reference to the mental health status and housing dissatisfaction factors observed in international students in Japan in prior studies (Kono et al., 2015; Nguyen et al., 2019).

The first page of the questionnaire contained information regarding the purpose and details of the study, and participants proceeded after providing informed consent. All the questions were mandatory so it was not possible to submit an incomplete questionnaire, but the process could be cancelled easily at any time. Answers were submitted anonymously to protect participant confidentiality and encourage truthful responses.

Questionnaire format

The self-administered online questionnaire consisted of questions categorized into three sections: 1) general sociodemographic characteristics; 2) mental health status, primarily a subset of the General Health Questionnaire (GHQ-12); and 3) living space characteristics.

General sociodemographic characteristics

The participants were asked to self-report their characteristics, including their study level, age, gender, nationality, and whether they felt that they had sufficient income to cover their daily needs.

Mental health status

The participants were asked the 12 questions of the GHQ-12, a tool to assess levels of psychological distress often used in mental health studies because of its wide-ranging applicability and versatility (Goldberg et al., 1997). Answers were graded via the standard 0-1-2-3 Likert scale format, with a possible minimum score of 0 and a maximum score of 36, with a higher score indicating more severe psychological distress.

In addition to the GHQ-12, this section also included an additional question asking whether the participants were accustomed to life in Japan. Although a single question cannot capture the full nuance of acculturative stress (Schumann et al., 2020), it was intended as a simple low-burden item to approximate the general combined effect of disorientation, confusion and frustration that international students can experience (Smith, 2021), which could plausibly have implications for the experience of their living space.

Living space characteristics

The specific living space characteristics included in this study were derived from those indicated to be associated with mental health status in the literature review and constituted aspects of housing quality and neighborhood quality according to our theoretical framework. Considering the importance of academic performance to the international student population and the increase in opportunities to study and attend lectures remotely at home, particularly following the COVID-19 pandemic (Morris et al., 2024), we accounted for characteristics that could feasibly contribute to housing comfortableness as both a relaxation environment and a study environment. The questions asked the participants whether their accommodation was single or shared, whether the size was large enough for their needs, whether they had sufficient natural light, whether they experienced noise pollution, whether they had sufficient nearby green space, and whether they had socialization opportunities with nearby residents.

Statistical analysis

Poisson regression models were created to assess which of the listed independent variables were associated with the prevalence of moderate psychological distress, as indicated by a GHQ-12 score of 14 points or above. The 13/14 point cutoff was considered appropriate here considering the recommendation that the sample population mean GHQ-12 score be used as a rough guide for selecting the caseness threshold (Goldberg et al., 1998). Robust-error-variance Poisson regression models were used due to the relatively high prevalence of psychological distress in the study population and to account for potential heteroskedasticity in the data.

An analysis was first performed on the full sample (Table 2), with Model A being an unadjusted crude model regressing each of the independent variables separately on symptoms of moderate psychological distress (GHQ-12≥14 pts) and Model B being a fully adjusted multivariable model including all living space characteristic variables and control variables together. Study level is displayed for illustrative purposes in the descriptive statistics (Table 1) but is not used as a control variable in the Poisson regression analysis.

For the purposes of streamlining the analysis, variables derived from multiple-choice or freestyle questionnaire items were simplified to dummy variables where appropriate. Age was simplified to a binary (‘30 or under’, ‘31 or over’) due to the small number of participants providing ‘20 or under’ or ‘41 or over’ responses in the final sample (<5%). Nationality was simplified to a dummy variable representing whether participants’ input nationality was from a country within East Asia, other Asia, or outside Asia, as this was a convenient simplified grouping based on cultural closeness to Japan according to the individualism-collective scale and other dimensions of cultural distance as proposed by Hofstede (2001).

To address study question (2) “Do associations between living space characteristics and international student mental health status depend on the length

of time lived in Japan?", the sample was also stratified into those participants who had lived in Japan for 12 months or less (Model C) or 13 months or more (Model D) to ascertain whether at least one year of time for adaptation altered the mental health implications of their living environment.

The significance level for the analyses was set at $P < 0.05$. Analyses were performed via STATA for Windows (version 16.1).

RESULTS

Descriptive statistics

Completed questionnaires were submitted by 159 respondents via the postcard QR code link and 18 respondents via the online distribution link, totaling 177 questionnaires used in the data analysis. Descriptive statistics are presented in Table 1, with statistics for the full sample (n=177) followed by statistics for the sample stratified by time lived in Japan (12 months or less (n=75), 13 months or more (n=102)).

The mean GHQ-12 score was 13.4 (SD 7.1), and 40.1% passed the ≥14 pts threshold, indicating moderate psychological distress, which was broadly consistent with the levels observed among international students in reference studies. A Cronbach's alpha of 0.90 indicated a high level of internal consistency between the GHQ-12 questions.

The participants were predominantly postgraduate students (94.9%), were aged 30 years or under (59.9%), were male (60.5%), were from a country within Asia (72.3%), and reported that their current income was not enough for their needs (54.2%). They predominantly reported feeling accustomed to life in Japan (85.3%).

With respect to living space characteristics, the participants were predominantly living in single occupancy accommodations (75.1%), reported that the accommodation size was large enough for their needs (91.0%), had sufficient natural light (94.4%), did not suffer noise pollution (63.8%), had sufficient nearby green space (89.8%), and had socialization opportunities with nearby residents (72.3%).

When stratified by time lived in Japan, the two groups displayed a broadly similar demographic profile, although the '13 months or more group' had more students aged 30 years or under (64.7% compared with 53.3%) and more students from countries within East Asia (26.5% compared with 8.0%).

Table 1: Descriptive statistics for full sample, and stratified by time lived in Japan (12 months or less, 13 months or more)

Characteristics		Full sample (n=177)		Lived Japan ≤ 12 months (n=75)		Lived Japan ≥ 13 months (n=102)	
		Mean or n	(SD or %)	Mean or n	(SD or %)	Mean or n	(SD or %)
GHQ-12 Score	Mean	13.4	(7.1)	13.0	(7.0)	13.7	(7.2)
	≤ 13 pts	106	(59.9)	48	(64.0)	58	(56.9)
	≥ 14 pts	71	(40.1)	27	(36.0)	44	(43.1)
Study Level	PhD	73	(41.2)	15	(20.0)	58	(56.9)
	Masters	95	(53.7)	55	(73.3)	40	(39.2)
	Other	9	(5.1)	5	(6.7)	4	(3.9)
Age	≤ 30 yrs	106	(59.9)	40	(53.3)	66	(64.7)
	≥ 31 yrs	71	(40.1)	35	(46.7)	36	(35.3)
Gender	Male	107	(60.5)	48	(64.0)	59	(57.8)
	Female	70	(39.5)	27	(36.0)	43	(42.2)
Nationality	Non-Asia	49	(27.7)	21	(28.0)	28	(27.5)
	East Asia	33	(18.6)	6	(8.0)	27	(26.5)
	Other Asia	95	(53.7)	48	(64.0)	47	(46.1)
Income Enough	Yes	81	(45.8)	33	(44.0)	48	(47.1)
	No	96	(54.2)	42	(56.0)	54	(52.9)
Accustomed to Japan	Yes	151	(85.3)	65	(86.7)	86	(84.3)
	No	26	(14.7)	10	(13.3)	16	(15.7)
Occupancy Type	Single	133	(75.1)	61	(81.3)	72	(70.6)
	Shared	44	(24.9)	14	(18.7)	30	(29.4)
Size Enough	Yes	161	(91.0)	70	(93.3)	91	(89.2)
	No	16	(9.0)	5	(6.7)	11	(10.8)
Natural Light	Yes	167	(94.4)	71	(94.7)	96	(94.1)
	No	10	(5.6)	4	(5.3)	6	(5.9)
Noise Pollution	No	113	(63.8)	52	(69.3)	61	(59.8)
	Yes	64	(36.2)	23	(30.7)	41	(40.2)

Table 1 (continued)

Characteristics		Full sample (n=177)		Lived Japan ≤ 12 months (n=75)		Lived Japan ≥ 13 months (n=102)	
		Mean or n	(SD or %)	Mean or n	(SD or %)	Mean or n	(SD or %)
Green Space	Yes	159	(89.8)	67	(89.3)	92	(90.2)
	No	18	(10.2)	8	(10.7)	10	(9.8)
Socialization Opportunities	Yes	128	(72.3)	52	(69.3)	76	(74.5)
	No	49	(27.7)	23	(30.7)	26	(25.5)

Poisson regression analysis

Table 2 presents the results of a Poisson regression analysis conducted on the full sample (n = 177) to examine the relationships between potential explanatory variables and symptoms of moderate psychological distress, as measured by the GHQ-12. In the unadjusted crude model (Model A), the living space characteristics that demonstrated statistically significant associations with moderate psychological distress were size of room not large enough (PR 1.65, $p<0.05$), insufficient natural light (PR 1.83, $p<0.01$), and no socialization opportunities (PR 1.80, $p<0.01$). In the fully adjusted multivariable model (Model B), the only characteristic that retained a statistically significant association with moderate psychological distress was no socialization opportunities (PR 1.66, $p<0.01$).

Table 3 shows the results of a Poisson regression analysis performed on the sample stratified by time spent in Japan (12 months or less (n=75), 13 months or more (n=102)) to assess the associations between potential explanatory variables and symptoms of moderate psychological distress according to the GHQ-12. In the fully adjusted multivariable model for the '12 months or less' group (Model C), none of the included living space characteristics demonstrated a statistically significant association with moderate psychological distress. For the '13 months or more' group (Model D), the only characteristic that demonstrated a statistically significant association with moderate psychological distress was no socialization opportunities (PR 1.79, $p<0.05$).

Table 2: Associations between potential explanatory variables and moderate psychological distress (GHQ-12 score≥14 pts); results of Poisson regression analysis for full sample

Total (n=177)		(n=106)		(n=71)		(n=177)				(n=177)			
Characteristics		GHQ-12≤13		GHQ-12≥14		Model A: Crude				Model B: Multi variable			
		n	%	n	%	PR	95% conf		P>t	PR	95% Conf		P>t
Age	≤ 30 yrs	62	(58.5)	44	(41.5)	ref				ref			
	≥ 31 yrs	44	(62.0)	27	(38.0)	0.92	0.63	1.33	0.646	1.00	0.69	1.45	0.999
Gender	Male	72	(67.3)	35	(32.7)	ref				ref			
	Female	34	(48.6)	36	(51.4)	1.57	1.10	2.24	0.013	1.50	1.06	2.13	0.023
Nationality	Non-Asia	28	(57.1)	21	(42.9)	ref				ref			
	East Asia	22	(66.7)	11	(33.3)	0.78	0.43	1.39	0.398	0.86	0.50	1.46	0.569
	Other Asia	56	(58.9)	39	(41.1)	0.96	0.64	1.44	0.835	1.06	0.70	1.59	0.793
Income Enough	Yes	51	(63.0)	30	(37.0)	ref				ref			
	No	55	(57.3)	41	(42.7)	1.15	0.80	1.67	0.447	0.85	0.57	1.26	0.422
Accustomed to Japan	Yes	100	(66.2)	51	(33.8)	ref				ref			
	No	6	(23.1)	20	(76.9)	2.28	1.67	3.10	0.000	1.98	1.44	2.73	0.000
Occupancy Type	Single	77	(57.9)	56	(42.1)	ref				ref			
	Shared	29	(65.9)	15	(34.1)	0.81	0.51	1.28	0.366	0.76	0.47	1.21	0.243

Table 2 (continued)

Total (n=177)		(n=106)		(n=71)		(n=177)				(n=177)			
Characteristics		GHQ-12≤13		GHQ-12≥14		Model A: Crude				Model B: Multi variable			
		n	%	n	%	PR	95% conf		P>t	PR	95% Conf		P>t
Size Enough	Yes	100	(62.1)	61	(37.9)	ref				ref			
	No	6	(37.5)	10	(62.5)	1.65	1.07	2.53	0.022	1.16	0.62	2.16	0.650
Natural Light	Yes	103	(61.7)	64	(38.3)	ref				ref			
	No	3	(30.0)	7	(70.0)	1.83	1.16	2.87	0.009	1.25	0.66	2.36	0.484
Noise Pollution	No	70	(61.9)	43	(38.1)	ref				ref			
	Yes	36	(56.3)	28	(43.8)	1.15	0.80	1.66	0.454	1.15	0.80	1.67	0.449
Green Space	Yes	97	(61.0)	62	(39.0)	ref				ref			
	No	9	(50.0)	9	(50.0)	1.28	0.78	2.12	0.332	1.01	0.60	1.69	0.968
Socialization Opportunities	Yes	86	(67.2)	42	(32.8)	ref				ref			
	No	20	(40.8)	29	(59.2)	1.80	1.28	2.54	0.001	1.66	1.15	2.38	0.006
Constant										0.26	0.16	0.41	0.000

Table 3: Associations between potential explanatory variables and moderate psychological distress (GHQ-12 score≥14 pts); results of Poisson regression analysis for sample stratified by time lived in Japan

Total (n=177)		(n=75)				(n=102)			
Characteristics		Model C: Multi variable, lived Japan ≤ 12 months				Model D: Multi variable, lived Japan ≥ 13 months			
		PR	95% conf		P>t	PR	95% Conf		P>t
Age	≤ 30 yrs	ref				ref			
	≥ 31 yrs	1.30	0.66	2.54	0.450	0.88	0.55	1.42	0.612
Gender	Male	ref				ref			
	Female	1.08	0.58	1.98	0.816	1.78	1.16	2.74	0.008
Nationality	Non-Asia	ref				ref			
	East Asia	0.45	0.12	1.75	0.250	0.91	0.49	1.69	0.769
	Other Asia	1.40	0.70	2.78	0.340	1.08	0.64	1.83	0.764
Income Enough	Yes	ref				ref			
	No	0.81	0.37	1.78	0.608	1.06	0.65	1.72	0.829
Accustomed to Japan	Yes	ref				ref			
	No	2.21	1.28	3.82	0.004	2.13	1.44	3.15	0.000
Occupancy Type	Single	ref				ref			
	Shared	0.57	0.19	1.67	0.303	0.80	0.49	1.30	0.362

Table 3 (continued)

Total (n=177) Characteristics			(n=75) Model C: Multi variable, lived Japan ≤ 12 months				(n=102) Model D: Multi variable, lived Japan ≥ 13 months			
		PR	95% conf		P>t	PR	95% Conf		P>t
Size Enough	Yes	ref				ref			
	No	0.48	0.15	1.55	0.218	1.58	0.84	2.99	0.157
Natural Light	Yes	ref				ref			
	No	2.80	0.72	10.83	0.135	0.85	0.37	1.96	0.711
Noise Pollution	No	ref				ref			
	Yes	0.68	0.33	1.38	0.286	1.56	0.98	2.47	0.060
Green Space	Yes	ref				ref			
	No	1.45	0.57	3.73	0.438	0.99	0.56	1.75	0.963
Socialization Opportunities	Yes	ref				ref			
	No	1.18	0.60	2.33	0.639	1.79	1.15	2.79	0.010
Constant		0.27	0.13	0.53	0.000	0.19	0.09	0.39	0.000

DISCUSSION

The primary findings of this study can be summarized as follows:

1. When controlling for sociodemographic and other factors, socialization opportunities with nearby residents was the only living space characteristic included in the analysis that was associated with the prevalence of moderate psychological distress symptoms.
2. When the sample was stratified by time lived in Japan to account for international students' adaptation to their environment, the association described in (1) was observable only for the group who had lived in Japan for 13 months or more.

Social living space characteristics

Making social connections has been highlighted as one of the key challenges faced by international students during their acculturation process (Costello, 2015), so socialization opportunities with nearby residents could conceivably play an important initial role for them while developing wider social networks over time. However, finding (2) suggests that such nearby socialization opportunities actually have greater mental health implications for longer-term residents, who have already gone through at least one year of acculturation. While determining the precise mechanism behind this is beyond the scope of the current study, insight might be gained from an existing relevant study into the experiences of international students in Japan which noted the tendency of some participants to rely on intracultural communication (i.e., with people from a similar cultural background) after trying and failing to meaningfully engage in intercultural communication with Japanese locals who persistently viewed international students as simply 'foreigners' (Taniguchi et al., 2022). In such a scenario, opportunities for intracultural communication with international student peers would have positive mental health implications even for longer-term residents. However, considering that the results of the current study also indicate that feeling 'not accustomed to life in Japan' is associated with an increased risk of moderate psychological distress symptoms, accommodation-centered socialization opportunities should ideally not isolate students from wider societies or disrupt their acculturation process—even if this process is itself challenging.

Physical living space characteristics

Considering that prior studies have presented at least partial evidence to indicate associations between physical (e.g., size, light, noise) living space characteristics and mental health status, it is noteworthy that no such associations were observable in the current study, at least in the fully adjusted regression models. Furthermore, the participants reported generally high satisfaction levels for these characteristics, reaching a positive response rate of up to 94.4% regarding the sufficiency of natural light. One possible explanation is that students may have

lower expectations or demands for temporary living arrangements, and indeed a prior study suggested that shorter residential stays can increase student satisfaction with their accommodations (Gong & Söderberg, 2023). Temporary residents are also less susceptible to the effects of persistent poor housing quality, which have been shown to impact mental health status beyond the effects of current circumstances (Pevalin et al., 2017). Another possibility is that the physical characteristics of the accommodations in the study area of Greater Tokyo may have been of sufficient baseline quality to prevent them from having significant mental health implications, which is consistent with the results of another Tokyo-based study of non-Japanese residents that reported that physical housing conditions were generally appraised as favorable yet were not significant predictors of overall residential satisfaction (Lim et al., 2024). However, even if this is the case in Greater Tokyo, it would be illustrative to conduct a nationwide study to account for potential differences in regional conditions as university internationalization initiatives continue to spread across Japan.

Policy implications

We recommend that international student accommodation managers continue to provide and promote opportunities for residents to socialize. The tendency among international students for feelings of loneliness to encourage further social withdrawal has been noted elsewhere (Zheng et al., 2023), so preventing the initiation of such a vicious cycle at an accommodation level could have substantial mental health benefits.

Ensuring availability and accessibility of good-quality housing is also a priority. Not being able to live in their preferred accommodation style has been shown to have significant implications for the well-being of international students (Corney et al., 2024), yet studies have described the difficulties international students can face in finding such preferred accommodations (Fang & van Liempt, 2021). In Japan, one study found that the success rate of private rental applications was lower for applicants with non-Japanese names (Sugasawa & Harano, 2023).

Like many urban areas worldwide, Greater Tokyo has also experienced land price inflation and the gradual vanishing of low-rent property tiers (Shiki, 2014), which impacts students since affordability is a high priority for them when choosing housing (Ike et al., 2020). If such trends continue then a certain level of compromise in quality may be necessary to maintain affordability, but at least efforts should be undertaken to preserve the living space attributes with positive implications for mental health: including, as this study has shown, socialization opportunities with nearby residents. Since accommodation satisfaction is also a key determinant of whether a student recommends an educational institution to their peers (Qadeer et al., 2021), protection of this valuable infrastructure will surely be worthwhile in the long term.

Strengths

This study has contributed a quantitative analysis of the associations between living space characteristics and the mental health status of international students to a field where quantitative analyses of these factors are currently lacking. The inclusion of multiple specific living space characteristic variables in the analysis also allowed for a more nuanced exploration of the topic than did studies using nonspecific 'housing satisfaction' or 'housing comfortableness' type measures. It is a timely study considering the recent shift to a post-COVID-19 new normal and increased opportunities for people to work and study at home, and understanding the mental health implications of living space in these new conditions requires contemporary research. It is also timely in the Japanese context, as studies of this type can help ensure that recent government targets to increase the international student population are healthy and sustainable.

Limitations and further study

This study has some key limitations. First, the cross-sectional design means that we cannot make inferences regarding the direction of causality between living space characteristics and mental health status, or rule out the risk that the participants' mental health status introduced reporting bias when answering the self-administered questionnaires. Second, although convenience random sampling in cooperation with student dormitories allowed for efficient participant recruitment, the sampling method means that we cannot generalize findings to the diverse range of study programs and living experiences of international students in the wider Japanese context.

While the motivation behind this research was to contribute a quantitative study to the field, qualitative studies could help address the questions raised by the results of the quantitative analysis. For example, in-depth participant interviews could help clarify what specific types of socialization opportunities would be most supportive of positive mental health outcomes.

CONCLUSION

This study explored the mental health implications of several living space characteristics for international students in Japan and revealed that the absence of 'socialization opportunities with nearby residents' was associated with an increased prevalence of moderate psychological distress symptoms. Furthermore this association was evident only in those participants who had lived in Japan for more than one year, indicating that socialization opportunities may have stronger implications for longer-term residents. As Japanese universities continue to welcome increasing numbers of international students, it is important that high-quality housing supporting good mental health is available.

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