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<u>I, Kruti S Chaliawala, hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in Health Education.</u>

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Balancing Health Abroad: A Comprehensive Study of International Students' Sexual Health and Psychological Well-Being.

Student's name: **<u>Kruti S Chaliawala</u>**

This work and its defense approved by:

Committee chair: **Rebecca Vidourek, Ph.D.**

Committee member: **Keith King, Ph.D.**

Committee member: **Ashley Merianos, Ph.D.**

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Balancing Health Abroad: A Comprehensive Study of International Students' Sexual Health and Psychological Well-Being

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by

Kruti S. Chaliawala

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MA University of Central Oklahoma, 2016

Committee Chair: Rebecca A. Vidourek, PhD

Committee Members: Keith A. King, PhD

Ashley L. Merianos, PhD

ABSTRACTS

Study One Abstract

Background: Sexual health behaviors among international students have gained prominence in recent years due to their increasing representation in global educational institutions. **Purpose:** The present study explored sexual health behaviors in the context of condom usage, partner relationships, and student grade level. **Methods:** A substantial sample size of international students ($N = 13,242$) was analyzed using a secondary data analysis of the 2022 American College Health Association's National College Health Assessment (ACHA-NCHA) dataset, revealing noteworthy findings regarding sexual activities and condom usage. **Results:** The findings indicate that a substantial proportion of international students engage in various sexual behaviors, including oral sex (50.8%), vaginal intercourse (51.3%), and anal intercourse (14.8%). Condom usage during sexual activities, particularly oral sex (4.1%) and anal sex (1.4%), was notably low. A multiple regression analysis rendered significance with sex, grade level, relationship, and number of partners as predictors to sexual health behaviors. **Conclusion:** The current study significantly contributes to the understanding of sexual health behaviors among international students. It underscores the importance of targeted interventions for promoting safe sex practices, the need for continuous access to sexual health resources, and the imperative for culturally sensitive and inclusive sex education programs on college campuses.

Study Two Abstract

Background: The influx of international students to the United States has been steadily increasing, with a substantial number of students choosing to pursue their education in this diverse and culturally rich nation. **Purpose:** The current study delves into the psychological well-being of international students in the US, aiming to uncover the extent of well-being and its

relationship with demographics and background characteristics. **Methods:** A secondary data analysis of $N = 13{,}242$ international students from the 2022 American College Health Association's National College Health Assessment (ACHA-NCHA) provided insight into their well-being, stress levels, gender, grade level, and ethnicity. **Results:** Most students reported moderate to high psychological well-being, underscoring their resilience. However, gender, grade level, and stress levels emerged as significant predictors of well-being, with female and graduate students facing particular challenges. Interestingly, while effective in univariate analyses, ethnicity did not play a pivotal role in predicting well-being in the final model, suggesting mediation by factors like acculturation stress and social support. **Conclusion:** The findings hold implications for educational institutions, policymakers, support service providers, and researchers, emphasizing the importance of tailored support and policies to enhance the well-being of international students.

ACKNOWLEDGEMENTS

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Global Perspectives on Sexual Health: Insights from International College Students in the United States

INTRODUCTION

In 2022, the United States witnessed a significant increase in the enrollment of international students, with the number of F-1 and M-1 visa holders reaching 1,362,157 (Boundless, 2023; IIE, 2022). The F-1 and M-1 visas are two nonimmigrant visa categories for persons wishing to study in the United States (U.S. Citizenship and Immigration Services, 2023). This figure represents a 10% rise from the previous year, effectively returning to pre-pandemic levels following the steep drop in 2020 (Boundless, 2023; IIE, 2022). Benefits and challenges surround the arrival of these international students at American higher education institutions. On the one hand, these students enhance campus diversity by bringing new viewpoints to classrooms and boosting the U.S. economy through tuition, fees, and living expenses (U.S. Department of State's Bureau of Educational and Cultural Affairs, 2023). On the other hand, international college students in the U.S. may face many challenges while adapting to American culture, which may significantly influence their overall well-being (Rivas, Hale, & Burke, 2019).

Previous research highlights the substantial influence of cultural, religious, and social determinants on the sexual health behaviors of international students in the United States, resulting in significant disparities in engagement with sexual health practices (Chaliawala et al., 2021; Simpson et al., 2015; Fairfortune et al., 2020). These determinants, deeply rooted in international students' backgrounds, profoundly impact their sexual attitudes and behaviors (Chaliawala et al., 2021; Simpson et al., 2015; Fairfortune et al., 2020). Cultural norms and values, shaped by diverse cultural backgrounds, play a pivotal role in influencing international students' choices regarding their sexual health. Moreover, religious beliefs, often unique to

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everyone, further contribute to the variability in sexual health practices among international students, as different religions hold distinct stances on sexual behavior, contraception, and relationships (Simpson et al., 2015).

In addition to cultural and religious factors, social determinants exert a significant influence on the sexual health behaviors of international students. These social determinants, encompassing peer influences and prevailing social norms, may lead students to conform to perceived norms and expectations within their social circles, thereby affecting their decisions related to sexual activity and protection (Fairfortune et al., 2020). Furthermore, social determinants can influence the willingness of international students to seek out sexual health information and services, shaping their overall sexual health behaviors (Parker et al., 2020).

Acculturation, the process of adapting to a new culture, represents another critical factor that contributes to the sexual health behaviors of international students (Martin, 2018). As international students navigate their host country's culture, these students may adopt different sexual norms and behaviors than those in their home countries. The availability and accessibility of sexual health information and services in the host country may also play a crucial role in shaping the sexual health behaviors of international students (Parker et al., 2020).

Cultural differences in attitudes toward sex, relationships, and contraception further impact the choices made by international students, adding complexity to the mosaic of sexual health behaviors (Song et al., 2005). Cultural backgrounds, religious beliefs, and the social norms and values of the host country all contribute to shaping international students' approaches to sexual health (Simpson et al., 2015; Petersson et al., 2016). Additionally, gender and student status may serve as additional differentiating factors in sexual health behaviors, with males and females often approaching sexual health differently. Variations in behavior can also emerge

between undergraduates and graduate students, given differences in exposure to sexual health information and understanding (Yang et al., 2018). Furthermore, demographic and background characteristics such as gender, student grade level, and partner relationships are crucial in shaping these behaviors. For instance, societal expectations dictate what is considered 'acceptable' behavior for different genders, significantly influencing the perception and experience of sexual health (Khumalo, Taylor, Makusha, Mabaso, 2020).

Similarly, a student's grade level can impact their exposure and comprehension of sexual health information, potentially influencing their behaviors. Partner relationships, with their unique dynamics, play a substantial role in affecting decisions related to sexual health (Khumalo, Taylor, Makusha, Mabaso, 2020). However, the intricate ways these factors interact and collectively influence sexual health behaviors among international students remain unexplored, warranting further investigation to understand better and address the complexities of this diverse demographic's sexual health experiences (Khumalo, Taylor, Makusha, Mabaso, 2020).

Despite extensive research on sexual health issues within college populations, there is a notable gap in addressing this topic, specifically among international students (Chaliawala et al., 2021). These students constitute a unique and culturally diverse demographic cohort within the academic milieu, requiring specialized investigation into their perspectives and behaviors regarding sexual health (UNESCO Institute of Statistics, 2020). While existing research offers valuable insights into the multifaceted nature of sexual health behaviors, it does not comprehensively address the nuanced variations within this population, particularly concerning factors such as cultural backgrounds, partner relationships, and safety perceptions (Chow et al., 2019).

The current study serves as a crucial endeavor to address this research gap by investigating sexual health among international students in the United States (Chaliawala et al., 2021; Martin, 2018). The present research may offer invaluable insights into the intricate sexual health landscape of this burgeoning and diverse subgroup. Moreover, this research investigates whether there are disparities in sexual health behaviors based on various demographic and background characteristics among international students (World Health Organization, 2023). It aims to shed light on the factors that influence sexual health behaviors, thereby laying the groundwork for the development of targeted interventions and support services tailored to the specific needs of this population. Consequently, the research questions at the core of this study are as follows:

1. To what extent do international students engage in sexual health behaviors?
2. To what extent did international students use condoms in the past 30 days?
3. Do sexual health behaviors differ based on demographics and background characteristics, such as sex, student grade level, partner relationships, and number of partners, among international students?

METHODS

Study Design

The current study was a secondary data analysis of the 2022 dataset from the American College Health Association's National College Health Assessment (ACHA-NCHA). The secondary data analysis was conducted upon approval from IRB. Specifically, the authors sought the Determination of Non-Human Subject research due to anonymity and public availability from the corresponding university IRB (2023-0755).

Participants

The dataset comprised a total of $N = 102,905$ college students across the nation. However, for this analysis, the focus was specifically on international students, resulting in a subset of $n = 13,242$ participants.

Procedure

The ACHA-NCHA is a nationally recognized research survey that provides precise data about students' health habits, behaviors, and perceptions. The 2022 ACHA-NCHA dataset was selected for this study due to its comprehensiveness and relevance. The data collection process involved administering the NCHA survey to participating academic institutions during the Spring and Fall of 2022. The survey was distributed electronically, and students had the opportunity to complete it voluntarily. The survey was self-administered, and participants' responses were confidential.

Instrument

The current study utilized various variables from ACHA-NCHA to assess sexual health behaviors, condom use, and socio-demographics, such as sex, age, visa status, grade level, number of partners, and partner relationships among international students. The respective questions for each variable are discussed below in their designated sections.

Sexual Health Behaviors

The sexual health behavior question asked the participants if they ever had 1) oral sex (oral/genital contact), 2) vaginal intercourse (penis in vagina), and 3) anal intercourse (penis in anus) (Never (1), Within the last 2 weeks (2), More than 2 weeks ago but within the last 30 days

(3), More than 30 days ago but within the last 3 months (4), More than 3 months ago but within the last 12 months (5), More than 12 months ago (6)).

Condom Use

The contraceptive question analyzed was how often the participants use a condom or other protective barrier (for example, male condom, female condom, dam or glove) during 1) oral sex, 2) vaginal intercourse, and 3) anal intercourse (Never (1), Rarely (2), Sometimes (3), Most of the time (4), Always (5)).

Partners

Two questions were analyzed related to partners 1) "Within the last 12 months, how many partners have you had oral sex, vaginal intercourse, or anal intercourse?" (Number) 2) "What is your relationship status?" (Not in a relationship (1), In a relationship but not married/partnered (2), Married/partnered (3)).

International Student

The participants were asked if they had a visa (for example, F-1 or M-1) to study or work in the United States. (No (1), Yes (2)).

Socio-demographics

The socio-demographic questions analyzed for the current study included: 1) "What sex were you assigned at birth?" (Female (1), Male (2) Intersex (3)), 2) "How old are you?" (years), 3) "What is your year in school?" (1st-year undergraduate (1), 2nd-year undergraduate (2), 3rd-year undergraduate (3), 4th-year undergraduate (4), 5th year or more undergraduate (5), Master's

(MA, MS, MFA, MBA, MPP, MPA, MPH, etc.) (6), Doctorate (PhD, EdD, MD, JD, etc.) (7),

Not seeking a degree (8), Other (please specify) (9)).

Data Analysis

After receiving approval from IRB, data analysis was conducted utilizing the Statistical

Package for the Social Sciences (SPSS) Version 26.0. For the primary data analysis, the data was

separated if participants answered "*Yes*" to the visa (yes or no) question. The background

information was analyzed using descriptive statistics. Research questions one and two were

analyzed using frequency and descriptive statistics. The third research question was analyzed

using a multiple regression model by creating a cumulative score of sexual behavior (oral,

vaginal, and anal sex) to convert the variable into a continuous variable rather than categorical.

RESULTS

Participants

The total sample size consisted of $N = 102,905$. Of these, 13,242 individuals answered

"yes" to having a visa, specifically F-1 and M-1, which are student visa categories and classify

these individuals as international students. Of 13,242 participants, 57.8% ($n = 7633$) reported

female, and 42.1% ($n = 5568$) reported male as the sex assigned at birth. A small number of

individuals (0.1%, $n = 9$) reported as intersex. The mean age of the participants was $M = 23.84$,

with a standard deviation of $SD = 5.9$. The sample consisted of undergraduate students in the

majority (55.4%, $n = 7235$), followed by graduate students (44.6%, $n = 5828$). Of these $n = 5828$

participants, 25.7% ($n = 3396$) reported as master's level students and 18.4% ($n = 2432$) as

doctoral level students. The maximum number of students (21%, $n = 2788$) reported South Asian

as their ethnicity, followed by East Asian (20.1%, $n = 2666$) and Hispanic or Spanish origin

(6.8%, $n = 906$).

Statistical Inferences

To what extent do international students engage in sexual health behaviors?

Of the $N = 13,242$ international students, 50.8% ($n = 6723$) reported engaging in oral sex, of which 20.6% ($n = 2682$) engaged within the last two weeks, 5.9 % ($n = 774$) within the last 30 days, 8.0% ($n = 1038$) within the last three months, and 7.9% ($n = 1034$) within the last 12 months. Moreover, 51.3% ($n = 6794$) reported vaginal intercourse, with 23.7% ($n = 3088$) engaging within the last two weeks, 5.1% ($n = 665$) within the last 30 days, 7.6% ($n = 985$) within the last three months, and 7.4% ($n = 961$) within last 12 months. Furthermore, 14.8% ($n = 1957$) ever engaged in anal intercourse, with 2.2% ($n = 282$) engaged within the last two weeks, 1.2% ($n = 155$) within the last 30 days, 1.7% ($n = 220$) within the last three months, and 2.4% ($n = 312$) within the last 12 months. *Table 2* represents the results showing the frequency and percentages of sexual health behaviors.

To what extent did international students use condoms in the past 30 days?

Of the $N = 13,242$ international students, 4.1% ($n = 546$) used condoms during oral sex. Of these, 1.4% ($n = 186$) sometimes used condoms, and 2.7% ($n = 360$) often used condoms when engaging in oral sex. Additionally, 16.8% ($n = 2226$) used condoms during vaginal intercourse. Of these, 2.9% ($n = 383$) sometimes used condoms, and 13.9% ($n = 1843$) often used condoms when engaging in sexual intercourse. The lowest frequency was recorded for condom use during anal sex (1.4%, $n = 182$). Of these, 0.5% ($n = 63$) sometimes used condoms, and 0.9% ($n = 119$) often used condoms when engaging in anal sex. *Table 3* represents the frequency and percentage of condom usage across the spectrum as reported by international students.

Do sexual health behaviors differ based on demographics and background characteristics, such as sex, student grade level, partner relationships, and number of partners, among international students?

A multiple regression analysis was conducted using the cumulative score of the sexual health behaviors (oral, anal, and vaginal sexual activity) as the dependent variable and the raw scores of biological sex, student grade level, partner relationships, and number of partners as independent variables. *Table 4* demonstrates the Analysis of Variance [ANOVA] of multiple regression analysis. Whereas *Table 5* bifurcates the model with predictors and their respective beta values. Overall, the multiple regression model was significant at $p < 0.05$ with a variance of $R^2 = 0.052$ and the $\pm SE = 2.89$. The multiple regression formula based on the result is

Sexual Health Behaviors = 8.408 + (0.166×Year in school) + (0.203×Biological sex) − (0.989×Relationship status) − (0.025×Last 12 months: Number of Partners). The formula represents the relationship between the dependent variable and the independent variables. The coefficients indicate the strength and direction of the relationship each independent variable has with the dependent variable.

DISCUSSION

The current study provides valuable insights into the sexual health behaviors of international students in the United States, with a sizable sample of 13,242 international students, predominantly composed of undergraduate students (55.4%) and young adults, as indicated by a mean age of 23.84 years. The findings illuminate a substantial engagement in various sexual behaviors among international students, including vaginal intercourse (51.3%), oral sex (50.8%), and anal intercourse (14.8%). These figures are consistent with previous research involving international college students (Chow et al., 2019; Douglass et al., 2020). However, the results

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underscore a critical need for tailored sexual health education and services within the college campus environment, with particular attention to the unique needs of the international student population. Cultural diversity among international students necessitates programs sensitive to varied cultural norms and values to promote safe sexual practices (Rivas et al., 2019; Parker et al., 2020).

Furthermore, this study unveils variations in sexual behaviors concerning different timeframes, with some international students reporting sexual activities within the last two weeks and others within the last 12 months. These distinctions in behavior can be attributed to factors such as cultural disparities, peer influences, and acculturation processes, signifying the evolving nature of international students' sexual behaviors throughout their academic journeys (Martin, 2018; Simpson et al., 2015). This emphasizes the necessity for educational institutions to provide continuous access to sexual health resources and information to support these students as their needs and behaviors transform over time.

Additionally, the study also delves into condom usage, revealing notable disparities in the application of condoms across various sexual activities. The data suggests relatively low condom usage rates, particularly during oral sex (4.1%) and anal sex (1.4%). These findings align with a study involving East Asian and sub-Saharan African international university students in Sydney, where condomless sexual practices were commonplace (Okeke, 2022). The findings reaffirm the concerns raised by the current study regarding inadequate condom use, especially in high-risk scenarios. Moreover, it is imperative to prioritize and intensify efforts to promote consistent and correct condom usage through sexual health programs, especially given the potential health risks associated with non-use, particularly in high-risk activities such as anal intercourse (World Health Organization, 2023).

Furthermore, this study delves into the nuanced relationship between demographic and background characteristics, such as biological sex, student level, partner relationships, the number of partners, and international students' sexual health behaviors. The multiple regression analysis, although significant, reveals a relatively low explained variance ($R^2 = 0.052$), indicating that the sexual behaviors of international students may be influenced by a complex interplay of factors extending beyond the scope of this study. Therefore, there is a compelling need for more extensive research to comprehensively understand the intricate relationships between cultural backgrounds, religious beliefs, social norms, and personal experiences and how these factors collectively shape sexual health behaviors among international students. The importance of considering diverse factors, as exemplified by previous studies that highlighted age and contraceptive use concerning condom usage (Fairfortune et al., 2022; Winer, 2016), underscores the necessity for nuanced and multifaceted sexual health interventions tailored to the specific and evolving needs of international students.

In conclusion, this study significantly enhances understanding of the sexual health behaviors of international students and informs the development of targeted interventions; this study contributes to promoting their overall well-being and safety. It underscores the importance of addressing sexual health issues among this population and highlights the role that universities can play in supporting their sexual health.

Implications

The results of this study carry substantial implications in various fields, emphasizing the necessity to tackle sexual health behaviors among international students in the United States. These implications are relevant for educational institutions, healthcare providers, policymakers, and the international student community. These implications advocate for an increased focus on

sex education programs that are culturally sensitive and tailored to the specific needs of this demographic.

As primary stakeholders in international students' well-being, educational institutions must recognize the importance of integrating comprehensive sexual health education into their curricula. The substantial sample size in this study provides robust evidence that most international students engage in various sexual behaviors, emphasizing the need for tailored sexual health programs. Institutions need to adopt culturally sensitive strategies that consider the diverse ethnic backgrounds of international students, as these factors significantly influence sexual behaviors (Chaliawala et al., 2021; Simpson et al., 2015; Fairfortune et al., 2020). It is crucial to encourage the development of sexual health literacy and the practice of safe sex, including the use of condoms, among the international student population (Okeke, 2022). Furthermore, recognizing the variation in sexual behaviors based on different timeframes, cultural differences, and acculturation processes necessitates educational institutions to provide continuous access to sexual health resources and information throughout the academic journey (Martin, 2018; Simpson et al., 2015).

Healthcare providers play a crucial role in supporting the sexual health of international students by offering accessible and affordable sexual health services (Parker et al., 2020). This study's findings indicate that there is a significant need for easy access to contraceptives, particularly condoms, on campus to promote safer sexual practices among international students. Condom usage was shallow during oral and anal intercourse, highlighting the importance of promoting consistent and correct condom use to prevent unintended health outcomes (CDC, 2023). These healthcare services should address cultural, social, and psychological factors that impact sexual behaviors among international students, addressing not only physical but also

mental health and adaptation challenges (Yang et al., 2018; Costello et al., 2022). Moreover, these services should be inclusive, considering the intersectionality of cultural norms and behaviors in shaping sexual health (Khumalo et al., 2020).

Policymakers should acknowledge the significance of this issue and consider it within the broader context of public health. The findings emphasize the need for targeted interventions aimed at promoting safe sex practices among international students. Low condom usage during sexual activities, especially high-risk ones such as anal intercourse, is a pressing concern. To mitigate this issue, policies should focus on increasing awareness of the importance of condom use (World Health Organization, 2023). Additionally, healthcare policies may prioritize ensuring access to contraceptives on campuses and promoting sexual health literacy, which can contribute to improving sexual behaviors and outcomes within this population.

For the international student community, these implications may emphasize the importance of seeking information and resources related to sexual health. International students should be encouraged to engage in sexual health education and awareness campaigns. Understanding diverse backgrounds and characteristics is essential for making informed decisions and adhering to safe sex practices (Simpson et al., 2015). Previous findings suggest that international students' behaviors are influenced by various factors, including cultural backgrounds, religious beliefs, and social norms (Fairfortune et al., 2022). Hence, it is crucial for international students to proactively access resources that address these influences to safeguard overall well-being and safety. These students are vital in championing the integration of unique viewpoints and needs into the broader discourse on sexual health.

In conclusion, addressing sexual health behaviors among international students cannot be overstated. These implications, aimed at educational institutions, healthcare providers,

policymakers, and international students themselves, highlight the urgency of implementing culturally sensitive sex education programs. These programs may encompass the diversity of international students' backgrounds and experiences, promote sexual health literacy, and ensure accessibility to contraceptives on campuses, thereby contributing to the promotion of safe sex practices and improved overall well-being within this population.

Limitations

Although insightful, the findings of the current study are subject to several noteworthy limitations. Firstly, the study's cross-sectional design restricts the ability to establish causal relationships or track temporal changes in sexual behaviors among international students. A longitudinal approach would enhance the understanding of the evolution of these behaviors over time. The potential for sampling bias arises due to the study's exclusive focus on a specific educational institution. Consequently, generalizing these findings to the broader international student population, which encompasses diverse demographics, cultural norms, and educational contexts, may be challenging. Another limitation is inherent in the self-report measures employed by ACHA to collect the data used in this study. These measures can introduce response bias and social desirability effects, impacting data accuracy. The study primarily examines broad sexual behavior categories and lacks depth in exploring contextual and motivational factors. Moreover, cultural, and ethnic diversity among international students, stemming from their varied national backgrounds, is not adequately considered, potentially overlooking significant cultural nuances influencing behaviors. Future research should extensively investigate cultural nuances within the sub-groups of international students.

Recommendations for Future Research

To advance college health professionals' understanding of the sexual health behaviors of international students and further inform sexual health interventions, several recommendations for future research are proposed. First, longitudinal studies should be conducted to track changes in sexual behaviors over time and assess the long-term effectiveness of sexual health interventions. Qualitative research can provide in-depth insights into the cultural, social, and psychological factors influencing sexual behaviors among international students (Costello, Maunsell, Cullen, Bourke, 2022). Additionally, conducting comparative studies that contrast the sexual health behaviors of international students with those of domestic students can help identify specific areas where international students may need additional support. Moreover, it is crucial to evaluate the impact of sexual health interventions on international students' behavior, knowledge, and attitudes, allowing for the development of evidence-based programs (CDC, 2023). Lastly, exploring inclusive approaches to sexual health education that consider the intersectionality of cultural norms and behaviors can provide a more comprehensive understanding of the factors influencing sexual health among international students (Khumalo et al., 2020).

CONCLUSION

In summary, this research significantly contributes to the comprehension of sexual health behaviors within the population of international students in the United States. The study's substantial sample size, predominantly comprising young adults, underscores the critical necessity for customized sexual health education and intervention strategies within the realm of higher education. The findings accentuate international students' distinctive perspectives and requirements, intricately intertwined with their diverse cultural backgrounds and life experiences.

It is imperative to acknowledge the evolving nature of their sexual behaviors and to ensure the consistent availability of sexual health resources throughout their academic journey. The study's revelations regarding the underutilization of condoms, particularly in the context of high-risk sexual activities, underscore the pressing need for initiatives aimed at promoting the consistent and correct application of condoms. Furthermore, the impact of demographic and background characteristics on sexual behaviors is duly acknowledged, thus underscoring the importance of nuanced intervention strategies that account for a multitude of influencing factors. This research not only advances the academic discourse on sexual health among international students but also carries substantial implications for educational institutions and healthcare providers striving to enhance the well-being of this distinct demographic. Further research is warranted to address these limitations, encompass more diverse samples, employ comprehensive measures, and explore cultural and temporal influences on international students' sexual health behaviors.

DISCLAIMER

The opinions, findings, and conclusions presented/reported in this article/presentation are those of the author(s). They are not meant to represent the corporate opinions, views, or policies of the American College Health Association (ACHA). ACHA does not warrant nor assume any liability or responsibility for the accuracy, completeness, or usefulness of any information presented in this article/presentation.

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Table 1

The frequency and the percentages of the demographic characteristics of international students.

Characteristic	Frequency (n)	Percentage (%)
Sex		
Female	7,633	57.8
Male	5,568	42.1
Intersex	9	0.1
Grade Level		
Undergraduate Students	7,235	55.4
Graduate Students	5,828	44.6
Master's Level Students	3,396	25.7
Doctoral Level Students	2,432	18.4
Ethnicity		
South Asian	2,788	21.0
East Asian	2,666	20.1
Hispanic or Spanish	906	6.8

Table 2

The frequency and the percentages of sexual health behaviors as reported by international students.

Sexual Behavior	Within 1 week (%)	Last 2 Weeks (%)	Last 30 Days (%)	Last 3 Months (%)	Last 12 Months (%)
Oral Sex	50.8% (6723)	20.6% (2682)	5.9% (774)	8.0% (1038)	7.9% (1034)
Vaginal Intercourse	51.3% (6794)	23.7% (3088)	5.1% (665)	7.6% (985)	7.4% (961)
Anal Sex	14.8% (1957)	2.2% (282)	1.2% (155)	1.7% (220)	2.4% (312)

Table 3

The frequency and the percentages of condom usage as reported by international students.

Condom Use	Frequency (*n*)	Percentage (%)
Condom use during oral sex		
Never	12,696	95.9%
Sometimes	186	1.4%
Often	360	2.7%
Condom use during vaginal intercourse		
Never	11,016	83.2%
Sometimes	383	2.9%
Often	1,843	13.9%
Condom use during anal sex		
Never	13,060	98.6%
Sometimes	63	0.5%
Often	119	0.9%

Table 4

The multiple regression analysis of the sexual health behavior of international students.

	Sum of Squares	df	Mean Square	F	p-value
Regression	2802.028	4	700.507	86.892	<0.001
Residual	50612.310	6278	8.062		
Total	53414.338	6282			

Note:

a. Dependent Variable: SexualActivity_CumulativeScore

b. Predictors: Last 12 months: number of sexual partners-Number of Partners, Biological sex, Year in school, Relationship status

Table 5

The multiple regression model analyzed using sexual health behaviors as the dependent variables against independent variables for international students.

	β	SE	t	*p-values*
(Constant)	8.408	.153	55.079	<0.001
Year in school	.166	.017	9.937	<0.001
Biological sex	.203	.073	2.769	0.006
Relationship status	-.989	.056	-17.669	<0.001
Last 12 months: number of sexual partners-Number of Partners	-.025	.010	-2.362	0.018

Note:

  a.   Dependent Variable: SexualActivity_CumulativeScore
  b.   The bold denotes significant variables.

Study Two: Investigating Psychological Well-Being among International College Students

in the United States

Investigating Psychological Well-Being among International College Students in the United

States

INTRODUCTION

In 2022, there was a noteworthy surge in the enrollment of international students in the

United States [US], resulting in 1,362,157 F-1 and M-1 visa holders (Boundless, 2023; IIE,

2022). F-1 and M-1 visas represent specific nonimmigrant visa categories tailored for individuals

seeking academic studies in the United States (US Citizenship and Immigration Services, 2023).

This surge marked a 10% increase from the preceding year, effectively reinstating enrollment

figures to pre-pandemic levels following a substantial decline in 2020 (Boundless, 2023; IIE,

2022). The presence of these international students within American higher education institutions

offers advantages as well as challenges. On the one hand, international students enrich campus

diversity by introducing fresh perspectives into classrooms and contributing to the US economy

through tuition, fees, and living expenses (US Department of State's Bureau of Educational and

Cultural Affairs, 2023). Conversely, international college students may encounter various

challenges while navigating the intricacies of American culture, potentially exerting a significant

impact on their overall well-being (Rivas, Hale, & Burke, 2019).

Psychological well-being, a foundational aspect of individuals' mental health,

encompasses contentment, fulfillment, and positive functioning (World Health Organization

[WHO], 2022). It encompasses having robust mental health, high levels of life satisfaction, a

sense of purpose or meaning, and effective stress management (WHO, 2022). This construct

constitutes a core element of mental health characterized by hedonic (enjoyment, pleasure) and

eudaimonic (meaning, fulfillment) happiness, as well as resilience (coping, emotion regulation,

healthy problem solving) (Tang, Tang, & Gross, 2019). One such tool employed to gauge

psychological well-being is the Diener Flourishing Scale, developed by Diener et al. (2010). This scale encompasses items that tap into feelings of purpose and meaning in life, positive relationships, and engagement in various activities. Within the context of international students, the Flourishing Scale serves as a valuable instrument for quantifying their psychological well-being and assessing their ability to adapt to the challenges and opportunities presented within a foreign academic and cultural environment (Diener et al., 2010).

International students frequently face a spectrum of stressors and adjustments linked to their academic, cultural, and social encounters. These stressors may have both favorable and adverse impacts on their psychological well-being. Prior research has identified various risk and protective factors that influence the psychological well-being of international students. Risk factors may encompass acculturative stress, racial identity, and academic stress, as demonstrated in previous research (Barbayannis et al., 2022; Iwamoto & Liu, 2010; Park et al., 2014). Equally, protective factors, such as social support, coping styles, and cultural adjustment, have also been recognized as significant contributors to the well-being of international students (Akhtar & Kroener-Herwig, 2019; Pinamang et al., 2021; Yang et al., 2018). Additionally, social support and resilience have been identified as mitigating factors that impact stress and enhance well-being (Brett et al., 2023; Pinamang et al., 2021). Moreover, the role of self-determined motivation and satisfaction of essential psychological needs in studying abroad may promote psychological well-being among these students (Yang et al., 2018).

Significantly, the mental health of international students is a topic of growing concern, leading campuses to reconsider their approach to addressing the needs of a diverse student populations (Abrahams, 2022). The mental health of international students has implications for academic performance, retention rates, and the overall campus climate (Smith & Khawaja,

2011). Coping styles and socio-demographic variables, such as sex and country of origin, wield substantial influence over the mental health of these students (Akhtar & Kroener-Herwig, 2019). These variables contribute to the diversity of experiences among international students and have been demonstrated to impact their psychological well-being uniquely. Notably, stress levels can vary based on cultural backgrounds (Ma et al., 2020), and sex-related disparities in psychological well-being have also been documented (Barbayannis et al., 2022).

Furthermore, stress represents a pervasive issue among international students, given the myriad of stressors associated with adjusting to new academic and cultural surroundings (Alharbi & Smith, 2018; Can, Poyrazli, & Pillay, 2021). These students encounter divergent stress levels, particularly when relocating to English-speaking countries, in which high-stress levels are often observed, thus potentially eroding psychological well-being. The intricate nature of stress among international students is further underscored by various studies (Alharbi & Smith, 2018; Can, Poyrazli, & Pillay, 2021). Additionally, the psychological well-being of international students in the US is influenced by their interactions with peers, faculty, and staff, interactions that the country of origin may shape. Katsumoto and Bowman (2021) discerned variations in the quality and nature of these interactions among students from different countries, indicating that the country of origin may influence the degree to which international students engage with their academic and social environment, ultimately affecting the well-being. The psychological well-being of international students in the US is a complex issue influenced by various socio-demographic variables, stressors, and protective factors. Understanding the unique challenges this population faces is crucial for developing effective strategies to support their mental health and enhance overall well-being. Hence, the research questions explored in the current study are:

1. What is the extent of psychological well-being among international students?

2. Does psychological well-being differ based on demographics and background characteristics such as sex, student grade level, ethnicity, and stress level?

METHODS

Study Design

The current study was a secondary data analysis of the 2022 dataset from the American College Health Association's National College Health Assessment (ACHA-NCHA). The secondary data analysis was conducted upon approval from IRB. Specifically, the authors sought the Determination of Non-Human Subject research due to anonymity and public availability from the corresponding university IRB (2023-0755).

Participants

The dataset represented $N = 102,905$ college students from across the nation. For the present analysis, the data was limited to international students ($n = 13,242$).

Procedure

The ACHA-NCHA is a nationwide research survey designed to gather detailed information on students' health patterns, conduct, and perspectives. For this study, the 2022 ACHA-NCHA dataset was chosen due to its extensive scope and applicability. The data collection phase entailed disseminating the NCHA survey to collaborating academic institutions in both the Spring and Fall of 2022. The survey was digitally distributed, allowing students to voluntarily participate and complete it. It was self-administered, ensuring the confidentiality of participants' responses.

Instrument

The current study utilized various variables from ACHA-NCHA to assess psychological well-being, 30-day stress levels, and socio-demographics, such as sex, age, visa status, grade level, and ethnicity among international students. The respective questions for each variable are discussed below in their designated sections.

Psychological Well-Being Scale

The participants were asked to rate their agreement or disagreement on a 7-point Likert scale with the statements provided. The statements included: 1) "I lead a purposeful and meaningful life", 2) "My social relationships are supportive and rewarding", 3) "I am engaged and interested in my daily activities", 4) "I actively contribute to the happiness and well-being of others", 5) "I am competent and capable in the activities that are important to me", 6) "I am a good person and live a good life", 7) "I am optimistic about my future", 7) "People respect me" (Strongly disagree (1), Disagree (2), Slightly Disagree (3), Neither agree nor disagree (4), Slightly agree (5), Agree (6), Strongly Agree (7)).

Stress Levels

The stress level question analyzed was: "Within the last 30 days, how would you rate the overall level of stress you have experienced?" (No stress (1), Low (2), Moderate (3), High (4)).

International Student

The participants were asked if they had a visa (for example, F-1 or M-1) to study or work in the United States. (No (1), Yes (2)).

Socio-demographics

The socio-demographic questions analyzed for the current study included: 1) "What sex were you assigned at birth?" (Female (1), Male (2) Intersex (3)), 2) "How old are you?" (years), 3) "What is your year in school?" (1st-year undergraduate (1), 2nd-year undergraduate (2), 3rd-year undergraduate (3), 4th-year undergraduate (4), 5th year or more undergraduate (5), Master's (MA, MS, MFA, MBA, MPP, MPA, MPH, etc.) (6), Doctorate (PhD, EdD, MD, JD, etc.) (7), Not seeking a degree (8), Other (please specify) (9)), 4) "Are you?" (East Asian (for example: Chinese, Japanese, or Korean) (1), Southeast Asian (for example: Cambodian, Vietnamese, Hmong, or Filipino) (2), South Asian (for example: Indian, Pakistani, Nepalese, or Sri Lankan)), 5) "Are you?" (Mexican, Mexican American, Chicano (1), Puerto Rican (2), Cuban (3)).

Data Analysis

After receiving approval from IRB, data analysis was conducted utilizing the Statistical Package for the Social Sciences (SPSS) Version 26.0. For the primary data analysis, the data was separated if participants answered "*Yes*" to the visa (yes or no) question. The background information was analyzed using descriptive statistics. Research question one was analyzed using frequency and descriptive statistics. The second research question was analyzed using a univariate logistic regression. The significant variables from the univariate regression analysis were then analyzed using a logistic regression model.

RESULTS

Participants

The total sample size consisted of $N = 102,905$. Of these, 13,242 individuals answered "yes" to having a visa, specifically F-1 and M-1, which are student visa categories and classify these individuals as international students. Of 13,242 participants, 57.8% ($n = 7633$) reported female, and 42.1% ($n = 5568$) reported male as the sex assigned at birth. A small number of

individuals (0.1%, $n = 9$) reported as intersex. The mean age of the participants was $M = 23.84$, with a standard deviation of $SD = 5.9$. The sample consisted of undergraduate students in the majority (55.4%, $n = 7235$), followed by graduate students (44.6%, $n = 5828$). Of these $n = 5828$ participants, 25.7% ($n = 3396$) reported as master's level students and 18.4% ($n = 2432$) as doctoral level students. The 30-day stress level indicated that the highest number of international students reported moderate stress (46.9%, $n = 6182$), followed by low (25.5%, $n = 3357$) and high levels of stress (24.2%, $n = 3191$). The maximum number of students (21%, $n = 2788$) reported South Asian as their ethnicity, followed by East Asian (20.1%, $n = 2666$) and Hispanic or Spanish origin (6.8%, $n = 906$).

Statistical Inferences

To what extent do international students report psychological well-being?

The total score on the Diener Flourishing Scale, reported by the international students, revealed that the majority (82.7%, $n = 10,841$) of these students fall between moderate to higher spectrum (≥ 5 scores) of psychological well-being. Comparatively, $n = 2,255$ (17.3%) students reported lower to moderate (≤ 4 score) psychological well-being on the scale. A further breakdown of each scale item and the respective frequencies can be found in *Table 1*.

Does psychological well-being differ based on demographics and background characteristics such as sex, student grade level, ethnicity, and stress level?

All the variables in the question were recoded into dichotomous variables to perform logistic regression analysis. All the items of the psychological well-being scale were recoded to "0" if the participant reported disagreement and "1" if the participant agreed with the statement. The cumulative score of all the recoded psychological well-being was calculated and again

recoded in "0" if the total score was less than or equal to four and "1" if the score was above or equal to five. The split was decided based on the coding instructions provided by the Diener Flourishing Scale (Diener et al., 2010). The univariate logistic regression analyses revealed that all the variables were significant at $p < 0.001$ except Puerto Rican ($p = 0.453$) and Cuban ($p = 0.245$) ethnicities. Moreover, the sex assigned at birth ($p = 0.051$) was approaching significance at $\alpha = 0.05$. *Table 2* reports the χ^2 and odds ratios (*OR*) for all the independent variables.

The significant variables were included in a multivariate logistic regression model to determine the prediction of psychological well-being by each of these variables. A logistic regression was performed to ascertain the effects of grade level, stress level, and ethnicity on psychological well-being. The overall logistic regression model resulted in $p = 0.053$. The Hosmer and Lemeshow test revealed that the model is a good fit ($p = 0.830$) of the data and allows further interpretation of the variables. The model explained 44.4% (Nagelkerke R^2) of the variance in psychological well-being and correctly classified 80.6% of the cases. The participants reporting high-stress levels were likely to score low on psychological well-being. Similarly, graduate international students were likely to report lower psychological well-being compared to undergraduate counterparts. Ethnicity did not play a crucial role, as per the model, in predicting the psychological well-being of the participants. *Table 3* reports the final logistic regression conducted on the significant variables and adjusted odds ratios. Additionally, *Figure 1* showcases the dispersion of the observed and predicted probabilities.

DISCUSSION

The psychological well-being of international students in the US is influenced by various factors, including demographic characteristics, academic stressors, and cultural differences. Several studies have delved into the roles of cultural adaptation, acculturation stress, and the

fulfillment of basic psychological needs in determining the well-being of international students (Ma, Pitner, Sakamoto, & Park, 2020; Li et al., 2013; Yang, Zhang, & Sheldon, 2018). The current study explored the demographic factors like sex, student grade level, and ethnicity as potential variables that may influence psychological well-being (Brett, Mathieson, & Rowley, 2023). Understanding these factors and their impact on psychological well-being is essential to develop effective support and intervention strategies.

As per the findings of this study, 17.3% of international students reported lower to moderate levels of psychological well-being. Previous studies coincide with the present findings that international students report lower levels of psychological well-being (Mori, 2000; Smith & Khawaja, 2011; Zhang & Goodson, 2011). This may suggest that international students face unique challenges and stressors such as language barriers, cultural differences, discrimination, isolation, and acculturation difficulties (Smith & Khawaja, 2011; Lee & Rice, 2007). On the contrary, the majority of the international students in this study reported moderate to higher levels of psychological well-being, with 82.7% falling into this category. This observation aligns with the literature on international students' psychological well-being, which suggests that many students adapt and flourish during their academic experiences (Brett, Mathieson, & Rowley, 2023; Iwamoto & Liu, 2010). The findings may indicate that international students who have higher levels of psychological well-being are more likely to cope effectively with the demands and challenges of studying abroad and to experience positive emotions and satisfaction with their lives (Luthans et al., 2015). These findings may underscore the resilience and adaptability of international students (Katsumoto & Bowman, 2021).

The univariate and the final logistic regression analysis revealed significant associations between psychological well-being and various demographic and background characteristics,

supporting the second research question. In terms of sex, the logistic regression model indicated that females were more likely to report lower scores on psychological well-being than males. This finding is consistent with prior research that suggests gender differences in psychological well-being, potentially attributed to cultural and social factors (Brett, Mathieson, & Rowley, 2023). This underscores the importance of tailored support and interventions for female international students to address their unique challenges (Pinamang et al., 2021).

Grade level also emerged as a significant predictor of psychological well-being in logistic regression analysis. Graduate international students were more likely to report lower psychological well-being compared to undergraduate students. This may be linked to the increased academic demands and stress levels often associated with graduate studies (Barbayannis et al., 2022). The transition from undergraduate to graduate education presents distinct challenges, and universities should consider providing additional resources and support to help graduate students manage stress and maintain their well-being (Prasath et al., 2022).

Furthermore, the level of stress was a robust predictor of psychological well-being in the univariate and the final regression model. Participants reporting high stress levels were more likely to score low on psychological well-being. This aligns with existing literature on stress and well-being among international students (Akhtar & Kroener-Herwig, 2019). High stress levels can negatively impact psychological well-being, highlighting the importance of implementing stress-reduction strategies and mental health support services for international students (Alharbi & Smith, 2018). Stress levels may serve as an indicator of psychological well-being, which may help measure the perceived intensity and frequency of stressful events and situations (Luthans et al., 2015). This may also imply that international students who experience higher levels of stress are more likely to suffer from psychological distress and lower well-being (Luthans et al., 2015).

Ethnicity, despite being significant in univariate analyses, did not play a crucial role in predicting psychological well-being in the final model. This suggests that the influence of ethnicity on psychological well-being may be mediated by other factors, such as acculturation and social support (Ma et al., 2020). International students belonging to different ethnicities may experience varying levels of acculturation stress (Katsumoto & Bowman, 2021). For example, East Asian students may suffer from acculturation stress distinct from that of South Asian students due to cultural difference and social ideologies (Katsumoto & Bowman, 2021). East Asian students may encounter challenges associated with navigating collectivist cultural norms and expectations in a more individualistic Western context, potentially influencing their psychological well-being (Katsumoto & Bowman, 2021). On the other hand, South Asian students might confront acculturation stress related to distinct cultural norms and practices, which can also have implications for their psychological well-being (Katsumoto & Bowman, 2021).

Furthermore, the role of social support in shaping psychological well-being should not be understated. The availability of a supportive social network, either within or outside their ethnic community, can significantly influence their ability to cope with stressors and, consequently, their overall psychological well-being (Pinamang et al., 2021). In this regard, the impact of ethnicity on psychological well-being may not be a direct effect but rather an outcome of the intricate interplay between cultural adaptation, social networks, and the unique experiences associated with each ethnic group.

The current study provides valuable insights into the psychological well-being of international students and the factors that influence it. While the majority of international students reported positive well-being, a notable portion reported lower well-being, particularly

among females and graduate students and those experiencing high stress levels. Universities and institutions should use these findings to inform targeted interventions and support services to ensure the well-being and success of all international students.

Implications

The implications of this study are multifold and hold significance for various stakeholders, including educational institutions, policymakers, support service providers, and researchers. Educational institutions in the United States have a critical role to play in ensuring overall well-being of international students. The findings of this study highlight the need for tailored support systems that recognize the diverse needs of international students. Institutions should consider implementing stress management programs and mental health services that specifically serve international students (Alharbi & Smith, 2018). Institutions may create a more inclusive and welcoming campus climate that values and respects diversity and multiculturalism. This could reduce the incidence and impact of discrimination, prejudice, and stereotyping that international students may encounter (Lee & Rice, 2007; Smith & Khawaja, 2011; Zhang & Goodson, 2011). Moreover, institutions should provide mentorship and support structures to help students navigate the academic and social challenges they face, particularly at the graduate level. Understanding the gender-specific differences in psychological well-being is imperative, as female international students may require additional support and resources to address their unique challenges (Pinamang et al., 2021). Additionally, educational institutions should provide more opportunities for international students to interact with domestic students, faculty, and other international students from different cultures and backgrounds to foster a sense of belonging, social support, and cross-cultural understanding (Lee & Rice, 2007; Smith & Khawaja, 2011; Zhang & Goodson, 2011).

Policymakers and government authorities responsible for overseeing international education should consider the results of this study when formulating policies and regulations. The study underscores the importance of ensuring that the well-being of international students remains a central consideration in policymaking. Policymakers should work towards creating an environment that fosters psychological well-being by promoting cultural diversity and facilitating access to culturally sensitive mental health services for all international students (Iwamoto & Liu, 2010). It is imperative to recognize that international students contribute significantly to the economy and culture of the United States, and their well-being directly impacts their success and satisfaction, thus influencing their choice to study in the country (US Department of State's Bureau of Educational and Cultural Affairs, 2023).

Support service providers within educational institutions and local communities should take heed of the results of this study. They play a pivotal role in aiding international students facing psychological challenges. Such providers should design and implement culturally sensitive programs that address the unique needs of students from various ethnic backgrounds. For instance, students from East Asian and South Asian backgrounds might require distinct forms of support to navigate acculturation stress and to foster well-being (Katsumoto & Bowman, 2021). Support services should also focus on stress management strategies, recognizing the detrimental impact of high stress levels on psychological well-being. They should foster a supportive environment that acknowledges the unique needs and experiences of female international students (Pinamang et al., 2021).

The implications of this study also extend to the research community. It underscores the importance of continued research into the psychological well-being of international students. Researchers should delve deeper into the interplay of acculturation, social support, and ethnicity,

as these factors appear to mediate the relationship between demographics and psychological well-being. Further investigations can provide a more comprehensive understanding of the complexities involved, allowing for more targeted interventions (Ma et al., 2020). Additionally, researchers should explore the long-term impacts of psychological well-being on the academic and personal trajectories of international students, considering factors such as cultural adaptation and social support, to provide insights that can enhance support services and policies in the future. Recognizing and addressing the challenges faced by these students not only contributes to their academic success but also strengthens the cultural, economic, and academic fabric of the US.

Limitations

The current study presents certain limitations that should be acknowledged. First, the cross-sectional design hinders the establishment of causal relationships and dynamics in psychological well-being. Longitudinal studies would be needed for a more comprehensive understanding. Second, the non-probability convenience sample used by ACHA may not fully represent the diversity of international students in the US, potentially introducing selection bias. Third, self-report measures, susceptible to biases, were used to collect data on psychological well-being and stress levels. Moreover, the study's reliance on a single item to assess ethnicity oversimplifies a complex construct. It fails to explore the specific cultural and contextual factors associated with each ethnicity. In summary, while this study offers valuable insights, these limitations should be considered when interpreting the results and guiding future research, practice, and policy in the examination of international students' psychological well-being.

CONCLUSION

In conclusion, this study advances the understanding of the psychological well-being of international students in the United States. The majority of participants reported moderate to high levels of well-being, emphasizing the resilience and adaptability of international students. However, a significant portion faced challenges, particularly female and graduate students, as well as those experiencing high stress levels. The interplay of demographic factors and well-being underscores the need for targeted support and interventions. Importantly, ethnicity's complex relationship with psychological well-being, mediated by factors like acculturation and social support, suggests the need for a nuanced approach. The study's findings carry implications for educational institutions, policymakers, support service providers, and researchers in their quest to foster the well-being of international students. Understanding and addressing these challenges not only ensures academic success but also enriches the cultural, economic, and educational fabric of the US; thus, emphasizing the critical importance of psychological well-being in international education. Further research is warranted to delve deeper into the complexities of this topic, providing a more holistic understanding and informing tailored interventions.

DISCLAIMER

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Table 1

The frequency and percentages of the Diener Flourishing Scale Items as reported by international students.

Diener Flourishing Scale	Strongly Disagree		Disagree		Slightly Disagree		Neither Agree nor Disagree		Slightly Agree		Agree		Strongly Agree	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
I lead a purposeful and meaningful life	293	2.2	382	2.9	593	4.5	1486	11.3	2346	17.8	4763	36.1	3323	25.2
My social relationships are supportive and rewarding	252	1.9	310	2.4	524	4.0	1309	9.9	2650	20.1	4955	37.6	3180	24.1
I am engaged and interested in my daily activities.	308	2.3	391	3.0	763	5.8	1433	10.9	2932	22.3	4635	35.2	2714	20.6
I actively contribute to the happiness and well-being of others.	208	1.6	222	1.7	353	2.7	1341	10.2	2744	20.9	2917	37.4	3375	25.6
I am competent and capable in the activities that are important to me.	202	1.5	227	1.7	420	3.2	1003	7.6	2286	17.3	5246	39.8	3796	28.8
I am a good person and live a good life.	202	1.5	181	1.4	360	2.7	1167	8.9	2088	15.8	4921	37.3	4257	32.3
I am optimistic about my future.	332	2.5	395	3.0	601	4.6	1358	10.3	2288	17.4	4246	32.2	3959	30.0
People respect me.	199	1.5	205	1.6	384	2.9	1531	11.6	2353	17.9	5257	39.9	3241	24.6

Table 2

Univariate Logistic Regression analysis conducted on the psychological well-being within international college students.

Item	Psychological Well-Being		χ^2	OR	CI	p
	Low	High				
	n (%)	n (%)				
Sex						
Female(0)	1610 (56.3)	5955(58.4)	3.879	1.0	(1.001, 1.101)	
Male(1)	1249 (43.7)	4247 (51.6)		1.049		0.051
Grade Level						
Undergraduate(0)	1742 (61.6)	5418 (53.7)	55.898	1.0	(1.270, 1.507)	
Graduate Student(1)	**1086 (38.4)**	**4673 (46.3)**		**1.383**		**<0.001**
Level of Stress						
Low(0)	448 (15.7)	3325 (32.6)	311.889	1.0	(1.225, 1.277)	
High(1)	**2413 (84.3)**	**6877 (67.4)**		**1.251**		**<0.001**
Ethnicity						
Mexican/Chicano(1)	**180 (48.8)**	**503 (38.2)**	**13.486**	**1.278**	**(1.128, 1.449)**	**<0.001**
Puerto Rican(1)	19 (5.1)	64 (4.9)	0.053	1.060	(0.644, 1.746)	0.453
Cuban(1)	9 (2.4)	44 (3.3)	0.766	0.731	(0.360, 1.483)	0.245
East Asian(1)	**649 (47.9)**	**1982 (42.7)**	**11.308**	**1.121**	**(1.050, 1.196)**	**<0.001**
Southeast Asian(1)	**193 (14.2)**	**508 (11)**	**10.975**	**1.300**	**(1.114, 1.517)**	**<0.001**
South Asian(1)	**509 (37.6)**	**2117 (45.7)**	**27.876**	**0.823**	**(0.763, 0.887)**	**<0.001**

Note:

a. The bold denotes the significant values at $p < 0.001$

Table 3

The final logistic regression of the psychological well-being against significant variables from the univariate analysis for international students.

	β	Wald (β)	*AOR*	*p-value*	95% CI Lower	95% CI Upper
Stress	**1.000**	**134.007**	**2.717**	**<0.001**	**0.311**	**11.59**
Grade Level	**0.387**	**27.83**	**1.472**	**<0.001**	**1.275**	**1.699**
South-Asian	0.124	0.460	1.132	0.498	0.791	1.619
Southeast Asian	-0.145	0.632	1.156	0.427	0.605	1.237
East Asian	-0.111	0.385	1.117	0.535	0.630	1.271

Note:

a. The bold denotes significant values at $p < 0.001$

Figure 1. The following graph shows the dispersion of observed versus predicted probabilities to demonstrate the accuracy of the logistic regression model employed to analyze the data. The probabilities are in a linear alignment suggesting that logistic regression model is a good fit.