Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
University students’ travel risk perceptions and risk-taking willingness during the COVID-19 pandemic: A cross-sectional study

Jordan Akritidis a,*, Sarah L. McGuinness a,b, Karin Leder a,c

Abstract

Background: Student travellers are recognised as a group at high risk of travel-related morbidity, but few previous studies have evaluated students’ perceptions of or willingness to take risks during travel. Individual risk propensities may influence travellers’ engagement in pre-travel healthcare and can therefore inform strategies in pre-travel risk communication. This study aimed to describe the factors influencing risk-taking willingness, risk perceptions and future health-seeking intention among student travellers.

Method: We conducted a cross-sectional online survey (June–August 2021) among students enrolled at Monash University, Melbourne, Australia. Primary outcomes were travel-related risk-taking willingness and risk perceptions, measured using the health/safety items of the validated Domain-Specific Risk-Taking (DOSPERT) scale.

Results: Four hundred and eighteen students completed the survey. The mean age of respondents was 25.61 years, 78% were female and 46% were born outside Australia. Greater willingness to take risks was predicted by younger age (<25 years), being Australian-born, greater travel experience (3+ trips), having previously sought PTA, and perceiving oneself at low risk of severe COVID-19. We found no significant predictors of risk perception. Increased intention to seek pre-travel advice in the future was associated with greater risk perception, younger age, and perceiving oneself at high risk of severe COVID-19.

Conclusion: These findings support the rationale for a greater role of risk communication in travel medicine promotion strategies. We recommend that this could be achieved through 1) increasing risk perception by emphasising potential travel-associated risks, 2) personalising information about travel risks, 3) addressing perceived benefits of engaging in risky behaviours, and 4) reinforcing self-efficacy.

1. Introduction

In 2016, youth and student travellers constituted 333 million – or 23% of – international travellers [1]. Students often travel to riskier destinations and for longer durations than other travellers [2,3], and risk-taking tendencies often peak during adolescence and early adulthood, with these factors contributing to the identification of students as a group at high risk of travel-related morbidity [4]. Modifiable risky travel behaviours such as drinking tap water or eating uncooked foods [5], engaging in unsafe casual sexual behaviours [2], non-adherence to anti-malarial regimens in high-risk destinations [6], and failure to seek treatment following exposure to blood-borne infections [7] may all be directly linked to adverse health outcomes. The risk of travel-related illness can potentially be reduced by professional pre-travel advice (PTA) which provides relevant education regarding risk avoidance measures [8]. However, students have lower rates of PTA engagement and adherence than other travellers [9,10] which potentially contributes to increased travel-related morbidity. Engaging in health behaviours such as seeking PTA requires an intention to act [11]. Intention signifies the end of deliberation about a behaviour and consolidates one’s capacity to perform that behaviour. Previous studies have identified risk perceptions as a determinant of health-seeking intentions, with risk perceptions being fundamental to theories of health behaviour and strongly associated with motivations to health-seeking practices [12]. Psychologists have developed tools to assess risk perceptions and risk-taking willingness in commonly encountered content domains [13] which have previously been used to investigate health behaviours in a range of contexts, including during international travel [14]. However,
most previous analyses of health-related travel risk perceptions have neglected the incorporation of validated psychometric measures, undermining the potential role that risk perception data could play in informing pre-travel risk communication.

The COVID-19 pandemic emphasised the connectedness between travel and health through a range of measures including border restrictions and vaccination requirements [15]. These have likely impacted individual risk propensities and health behaviours associated with travel. The primary aim of this study was to describe the factors influencing risk perceptions and risk-taking willingness among student travellers. Our secondary aim was to describe the factors associated with increased intention to seek PTA in the future compared with prior to the pandemic. We hypothesised that students’ attitudes towards travel-related health risks and PTA-seeking will have increased since COVID-19 emergence. Improved understanding of these factors could inform strategies for optimally engaging prospective student travellers in preventive health services, thereby potentially improving uptake of and adherence to advice on risk-avoidance measures and minimising acquisition of travel-related illnesses.

2. Methods

2.1. Study design and setting

We conducted a mixed-methods study among Monash University students and staff, consisting of a cross-sectional online survey (June–August 2021; findings reported here) followed by semi-structured interviews among a subset of students (October–November 2021; findings to be reported elsewhere). Monash University’s main campuses are in Melbourne, Australia, and in Malaysia. Monash is one of Australia’s largest universities (>80,600 enrolled students and approximately 16,000 staff members) [16]. At the time the study was performed, Australia’s international borders were closed, which barred some international students from residing in Melbourne and consequently they engaged remotely.

The survey consisted of 32 fixed response questions and was administered electronically via REDCap [17]. Data collected included participant characteristics, risk-taking willingness, risk perceptions, past travel experiences, travel health concerns and PTA-seeking intention. The latter three categories were developed based on travel medicine expert consensus [4]. The survey took approximately 10 min to complete and remained open from 9th June 2021 to 15th August 2021.

We report this study in line with the STrengthening the Reporting of Observational studies in Epidemiology guidelines [18].

2.2. Participant recruitment

All current Monash University student and staff members aged >16 years were eligible to participate, regardless of faculty or campus. To reach as many staff and students as possible, direct contact was made with communications coordinators at all 10 Faculties at Monash University Australia. The survey link was distributed via social media, Faculty and School newsletters, student forums, and via posters displayed at Monash University Health Services clinics at the main Monash campus in Melbourne. Informed consent was obtained from participants at the beginning of the survey. Ethics approval was granted by the Monash University Human Research Ethics Committee (Project 28955).

Despite targeting both students and staff in recruitment, we ultimately decided to focus our analyses on students only as they are a recognised group at greater risk of travel-related illness. Staff tended to be older than students and older travellers show higher rates of PTA uptake than younger travellers [19], and the greater propensity for risk-taking among younger age groups was in accordance with our study aims. Additionally, we were able to recruit a sufficient number of students to meet our sample size target. Respondents who indicated that they were both a student and staff member were included in analyses as students. Those who indicated that they were solely staff were omitted from analyses.

2.3. Outcomes and measurements

The primary outcomes for this study were risk-taking willingness and risk perception scores, measured by the Domain-Specific Risk-Taking (DOSPERT) scale health/safety domain (see Appendix) [13]. DOSPERT is a validated scale that assesses risk-taking in five domains. It has high reliability [20], uses a clear and interpretable scoring system, and is available in English. We chose to include the 6 items from the DOSPERT health/safety domain rather than the full 30-item scale because individual scores in this domain have been shown to be predictive of health behaviours during travel [14] and the items in this domain were scenarios likely to be encountered by students during travel. Participants completed the DOSPERT health/safety domain items twice. First, they were asked to rate their likelihood of engaging in the given activity during travel on a scale from 1 (extremely unlikely) to 7 (extremely likely). Scores from each of the 6 items were added to generate a risk-taking willingness score (range: 6–42), with higher scores indicating a greater willingness to take risks. Second, students were asked to rate their perception of how risky the given activity was on a scale from 1 (not risky at all) to 7 (extremely risky). Scores from each item were added to generate a risk perception score (range: 6–42), with higher scores indicating greater levels of perceived risk.

Our secondary outcome was to assess the factors associated with future PTA-seeking intention, with participants indicating the extent to which they agreed with the statement “I am more likely to seek pre-travel health advice in the future than I was before the COVID-19 pandemic” on a 5-point Likert scale (strongly disagree to strongly agree). Responses were collapsed to create a binary variable where affirmative responses (agree or strongly agree) were compared to negative or neutral responses (strongly disagree, disagree, or neither agree nor disagree).

2.4. Analysis

Data were analysed using Stata v17 [21]. Surveys were considered complete if participants had responded to the six items of the DOSPERT health/safety domain for both risk-taking willingness and risk perception. Participant characteristics and outcomes were summarised using means and standard deviations. Differences in mean DOSPERT health/safety scores between groups were assessed using t-tests or Chi-squared tests as appropriate for the data. DOSPERT health/safety scores were log-transformed to counteract skewness and a multiple linear regression model was used to determine the demographic and travel predictors of risk-taking willingness and risk perception. We also used a binary logistic regression model to determine predictors of future PTA-seeking intention. All models included age and gender to reduce confounding. Regression coefficients, odds ratios, and p-values (significant if p < 0.05) were reported.

In previous studies, a between-group difference in mean DOSPERT health/safety domain scores of 2.0 points or more was considered significant [13,14]. Therefore, we aimed to recruit a total sample of 320, sufficient to enable detection of a between-group difference (in mean risk-taking willingness and risk perception) of 3 points with 80% power and an alpha of 0.05.

3. Results

Of the 430 students who commenced the survey, 418 (97.2%) submitted complete responses. Based on the 2021 student population of Monash University, approximately 0.5% (418/80,668) of students responded to the survey. International students made up 23.0% of our survey population, compared to 45.1% of students in the wider Monash University population. Table 1 details participants’ demographic and
Our study found that among Australian university students, higher risk perception scores in the DOPSPERT health/safety domain were predictive of increased intention to seek PTA in the future as compared to before the COVID-19 pandemic. Younger age and having a high perceived severity of COVID-19 were also predictive of greater future PTA-seeking intention.
Table 2A
Mean DOSPERT health/safety scores among subgroups. Higher risk-taking scores indicate greater willingness to take risks. Higher risk perception scores indicate a higher level of perceived riskiness.

| DOSPERT Risk-Taking Scale | DOSPERT Risk Perception Scale |
|---------------------------|-------------------------------|
| **Mean (SD)**             | **Score Mean (SD)**           | **p-value** |
| 13.56 (6.23)              | 33.16 (6.62)                  |             |
| 12 (9; 17)                | 34 (30; 37)                   |             |

**DEMOGRAPHIC CHARACTERISTICS**

- **Gender:** Male 0.620, Female 0.004
- **Age:** <0.001, <0.185
- **Country of birth:** Australian-born 0.001, Foreign-born 0.614

**TRAVEL CHARACTERISTICS**

- **Travel experience:** 0.033, 0.794
  - 0-2 trips 12.31, 33.33
  - 3 or more trips 13.90, 33.12
  - Previous uptake of PTA 14.27, 32.99
    - Past uptake of PTA 14.27, 32.99
    - No history of PTA 12.46, 33.09
  - Travel destinations 0.518, 0.216
    - More developed regions only 13.97, 34.00
    - More developed and less developed regions 13.47, 32.97
  - Reported travel-related illness 0.564, 0.523
    - Reported travel-related illness 14.49, 33.19
    - No travel-related illness 13.99, 32.51

**COVID-19 HEALTH PERCEPTIONS**

- **Perceived susceptibility to COVID-19:** 0.544, 0.010
  - High perceived severity (n = 490) 13.72, 33.53
  - Low perceived severity (n = 135) 13.27, 31.54
  - Perceived severity of COVID-19 <0.001, 0.073
    - High perceived severity (n = 178) 11.79, 34.00
    - Low perceived severity (n = 447) 14.34, 32.69

*Bolded p-values are statistically significant according to a Chi-squared test.

Table 2B
Predictors of DOSPERT health/safety scores.

| Risk-Taking | Beta coefficient 95% CI | p-value |
|-------------|-------------------------|---------|
| Gender: Male | 0.07 (−0.06, 0.19) | 0.287 |
| Age* | −0.01 (−0.02, 0) | 0.001 |
| Australian-born | 0.15 (0.04, 0.26) | 0.007 |
| Previously experienced travel-related illness | 0.1 (−0.04, 0.24) | 0.17 |
| 3+ previous international trips | 0.16 (0.01, 0.3) | 0.04 |
| Previous travel to more developed and less developed regions | −0.16 (−0.33, 0.01) | 0.058 |
| Past professional PTA uptake | 0.16 (0.04, 0.28) | 0.007 |
| High perceived susceptibility to COVID-19 | −0.03 (−0.16, 0.1) | 0.648 |
| Low perceived severity of COVID-19 | 0.18 (0.06, 0.3) | 0.003 |

Risk Perception

| Gender: Male | −0.06 (−0.15, 0.03) | 0.167 |
| Age* | 0 (−0.01, 0) | 0.411 |
| Australian-born | 0 (−0.07, 0.08) | 0.914 |
| Previously experienced travel-related illness | 0.03 (−0.06, 0.14) | 0.462 |
| 3+ previous international trips | 0.06 (−0.04, 0.17) | 0.236 |
| Previous travel to more developed and less developed regions | 0.01 (−0.22, 0.02) | 0.093 |
| Past professional PTA uptake | −0.1 (−0.04, 0.12) | 0.369 |
| High perceived susceptibility to COVID-19 | 0.04 (−0.03, 0.16) | 0.163 |
| Low perceived severity of COVID-19 | 0.07 (−0.12, 0.05) | 0.403 |

**CI, confidence interval.**

* Bolded p-values are statistically significant.
  * Beta coefficient obtained through log-transformed multiple linear regression modelling.
  # Continuous variable.

Table 3
Predictors of increased intention to seek PTA in the future than before the COVID-19 pandemic.

| Odds ratio (95% CI)* | p-value |
|---------------------|---------|
| Gender: Female | 0.72 (0.37, 1.41) | 0.34 |
| Age* | 0.93 (0.9, 0.97) | 0.002 |
| Australian-born | 1.21 (0.66, 2.2) | 0.542 |
| Never experienced travel-related illness | 0.96 (0.44, 2.1) | 0.925 |
| 0-2 previous international trips | 0.55 (0.24, 1.24) | 0.149 |
| Previous travel to more developed and less developed regions | 1.13 (0.46, 2.77) | 0.785 |
| No past professional PTA uptake | 0.76 (0.41, 1.4) | 0.372 |
| High perceived susceptibility to COVID-19 | 1.78 (0.89, 3.56) | 0.102 |
| High perceived severity of COVID-19 | 0.43 (0.22, 0.85) | 0.014 |
| DOSPERT Risk-Taking* | 1.01 (0.97, 1.06) | 0.574 |
| DOSPERT Risk Perception# | 1.06 (1.01, 1.11) | 0.011 |

**CI, confidence interval.**

* Bolded p-values are statistically significant.
  * Odds ratio (OR) obtained through binary logistic regression modelling.
  # Continuous variable.

generally more risk-averse [13,14]. Mean risk perception scores were higher in our study (33.16) than in a DOSPERT validation study (28.15) and a previous traveller study (30.09), while mean risk-taking willingness was lower (13.56 vs. 20.63 vs. 17.44). Potential explanations for these findings might include the higher proportion of females in our survey sample (79% compared to 47% and 61% in the previous studies) and the potential for heightened risk awareness in the setting of the COVID-19 pandemic which has likely influenced travel-related health concerns given the strengthened association between travel and health. A strength of our study was its relatively large sample size (n = 418) compared to a previous study measuring DOSPERT scores among travellers (n = 70) [14]. While previous studies have typically examined professional PTA uptake prior to their previous trip, we chose to examine uptake of professional PTA across all previous overseas trips. Amongst our well-travelled cohort (56.5% having travelled overseas more than 5 times), we found that just over a third of students had never sought PTA for any trip, 46.9% had sought it for at least one trip and 17.4% had sought it for every trip.

We found that younger age, being born in Australia, having greater travel experience, and previously engaging in PTA were predictors of greater willingness to engage in risky behaviours. As one might intuitively expect, those with greater propensity for risk-taking perceived themselves to be at lower risk of severe COVID-19. Previous studies have identified higher levels of perceived risk among female travellers [22–24]. While we identified higher risk perception scores among females in univariate analyses, female gender was not predictive of higher risk perception scores in regression analyses in our study.
neither demographic nor travel characteristics were predictive of risk perception in our study, understanding that individual risk calibrations vary within a population highlights the importance of an individualised approach to PTA as has been recommended by previous research [25]. Our study provides quantitative evidence to support this approach among student travellers. Our results showed that over half the students reported being more likely to seek PTA in the future than prior to the COVID-19 pandemic. Our finding that risk perception predicted PTA-seeking intention corroborates previous research showing a link between risk perception and health intention [26,27]. Heightening risk perceptions has been shown to increase engagement in health behaviours [28], and therefore risk communication for PTA promotional campaigns should take the approach of increasing risk perception by emphasising potential travel-associated risks (including pandemic threats). Additionally, risk perceptions have been shown to increase when the threat is actualised for the individual based on their own previous experience or the experience of someone in their social network [29]. About half the students in our study reported experiencing at least one travel-related illness in their lifetime; a history of gastrointestinal, febrile and respiratory illnesses were most commonly reported – syndromes also prevalent in GeoSentinel student data [30]. Within our sample, the main health concerns were gastrointestinal infection, physical injury and respiratory infections, which overlapped with two of the three most common illnesses previously experienced. This demonstrates that addressing risk appraisals by personalising information about previous and reported travel-related concerns may be effective in increasing PTA engagement.

Future PTA-seeking intention post-pandemic was significantly greater among students of younger age, potentially reflective of lower levels of previous PTA among these students. Younger age also significantly predicted health intention in a Japanese study [31]. Despite this, younger age was also associated with greater risk-taking willingness which is in keeping with the widely accepted notion that younger people have a greater propensity for risk-taking than older people which has also been reported in several studies among travellers [14,32,33]. Perhaps counterintuitively, past PTA engagement was a predictor of greater risk-taking willingness, but this may be partially explained by the close association between past PTA engagement and previous travel to risky destinations (p = <0.001), a greater number of previous trips (3+) (p = 0.012) and having previously experienced a travel-related illness (p = 0.004). In contrast to risk perceptions, risk-taking willingness did not influence future PTA-seeking intention, but for risk-takers who do present for PTA, we recommend that modifiable health-compromising behaviours be specifically addressed. Understanding students’ motivations for engaging in specific risky behaviours and discussing the associated risks should be emphasised during PTA consultation with the aim of decreasing the likelihood of engaging in that behaviour.

Another potentially effective strategy for increasing PTA uptake during travel may be through the promotion of self-efficacy, which has been identified as a significant predictor of engagement in prevention behaviours [34,35]. One study found that 94% of American study abroad students were confident/very confident in their ability to engage in preventive health behaviours [36], yet PTA uptake remains low among students. Self-efficacy can be hindered by perceived barriers: many of our students reported that they were already well-informed without PTA and/or already fully vaccinated which may be an obstacle to future PTA engagement, but may also indicate a reduced need for it.

Our study is limited by a low response rate and the use of convenience sampling, with results potentially being subject to self-selection bias and therefore may not be generalisable. Use of the DOSPERT scale was limited to the questions from the health/safety domain; however, this approach is supported by previous research indicating that individual scores in this domain are predictive of health behaviours during travel (and at home) and that other domains may not be useful for predicting traveller health behaviour [14]. Additionally, this study assessed general future travel whereas risk attitudes may differ based on specific travel destinations. Our study assessed future PTA-seeking intention, but a prospective cohort study designed to assess the extent to which health intention accurately predicts actual engagement in health behaviours could confirm these results.

4.1. Conclusion

This study utilised psychometric measures to propose recommendations for maximising risk communication in PTA promotion and consultation. Our findings suggest that this can be achieved through 1) increasing risk perception by emphasising potential travel-related risks, 2) personalising information about travel risks, 3) addressing the perceived benefits of engaging in risky behaviours, and 4) reinforcing self-efficacy. In light of the multidimensional nature of risk perceptions and risk-taking willingness, these strategies would have variable efficacy according to each individual’s inherent risk-taking propensity, but the relationship between risk perception and PTA-seeking intention observed in this study lays support for greater risk communication in PTA. These recommendations may have significant applicability in other traveller populations where PTA engagement and adherence are low. Our results support the use of the DOSPERT health/safety domain in future studies and travel medicine practice to identify travellers who are more willing to engage in risky behaviours and/or have lower levels of perceived risk.
Funding

This work was supported by a GSK Immunisation Grant [grant number 210917, 2020]. The funder had no role in the study design, collection, analysis, or interpretation of the data or preparation and submission of the manuscript.

Data availability

Data available upon request from the corresponding author

Declaration of competing interest

The authors have declared no conflicts of interest.

CRediT authorship contribution statement

Jordan Akritidis: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Project administration. Sarah L. McGuinness: Conceptualization, Methodology, Validation, Resources, Data curation, Writing – review & editing, Supervision, Project administration, Funding acquisition. Karin Leder: Conceptualization, Methodology, Validation, Resources, Writing – review & editing, Supervision, Project administration.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.tmaid.2022.102486.

Table 1

| Item | Description |
|------|-------------|
| 5    | Drinking heavily at a social function |
| 15   | Engaging in unprotected sex |
| 17   | Driving a car without wearing a seat belt |
| 20   | Riding a motorcycle without a helmet |
| 23   | Sunbathing without sunscreen |
| 26   | Walking home alone at night in an unsafe area of town |

Table 2A

Scales used in DOSPERT risk-taking

Participants were asked “For each of the following statements, please indicate the likelihood that you would engage in the described activity or behaviour if you were to find yourself in that situation while travelling overseas.”

| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
|----|----|----|----|----|----|----|
| Extremely Unlikely | Moderately Unlikely | Somewhat Unlikely | Not Sure | Somewhat Likely | Moderately Likely | Extremely Likely |

Table 2B

Scales used in DOSPERT risk perception

Participants were asked “For each of the following statements, please indicate how risky you perceive each situation.”

| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
|----|----|----|----|----|----|----|
| Not at all Risky | Slightly Risky | Somewhat Risky | Moderately Risky | Risky | Very Risky | Extremely Risky |

References

[1] UNWTO. Affiliate members global reports, volume thirteen — the power of youth travel. Madrid: World Tourism Organization; 2016.

[2] Angelin M, Evengard B, Palmgren H. Illness and risk behaviour in health care students studying abroad. Med Educ 2015;49(7):684-91.

[3] Troiano G, Mercone A, Bagnoli A, Nanzi N. International travelers’ sociodemographic, health, and travel characteristics: an Italian study. Ann Glob Health 2017;83(2):380-5.

[4] ISTM. Student Travel Abroad: International Society of Travel Medicine. https://www.istm.org/studenttravelgroup.

[5] Vilkan M, Pakkanen SH, Lääveri T, et al. Travelers’ health problems and behavior: prospective study with post-travel follow-up. BMC Infect Dis 2016;16:328.

[6] Caesar LM, Filler S, Wilson M, et al. Evaluation of reported malaria chemoprophylactic failure among travelers in a US University Exchange Program. 2002 Clin Infect Dis 2004;39(11):1583-8.

[7] Sharafeldin E, Soomawala D, Vandenbroucke JP, et al. Health risks encountered by Dutch medical students during an elective in the tropics and the quality and comprehensiveness of pre- and post-travel care. BMC Med Educ 2010;10:85.

[8] McGuinness SL, Spelman T, Johnson DF, Leder K. Immediate recall of health issues discussed during a pre-travel consultation. J Trav Med 2015;22(3):145-51.

[9] Heywood AE, Zhang M, Macintyre CR, Scale H. Travel risk behaviours and uptake of pre-travel health prevention by university students in Australia. BMC Infect Dis 2012;12.

[10] Fhogartaigh CN, Sanford C, Ihrens RH. Preparing young travellers for low resource destinations. BMJ 2012;345:e7179.

1 Blais AR, Weber EU. A Domain-Specific Risk-Taking (DOSPERT) scale for adult populations. Judgm Decis Mak. 2006;1:33-47.
[11] Ajzen I. The theory of planned behavior. Organ Behav Hum Decis Process 1991;50(2):179–211.
[12] Brewer NR, Chapman GB, Gibbons FX, et al. Meta-analysis of the relationship between risk perception and health behavior: the example of vaccination. Health Psychol 2007;26(2):136–45.
[13] Blais AR, Weber EU. A Domain-Specific Risk-Taking (DOSPERT) scale for adult populations. J Health Commun 2006;1:33–47.
[14] Farnham A, Ziegler S, Blanke U, et al. Does the DOSPERT scale predict risk-taking behaviour during travel? A study using smartphones. J Travel Med 2018;25(1).
[15] Neuburger L, Egger R. Travel risk perception and travel behaviour during the COVID-19 pandemic 2020: a case study of the DACH region. Curr Issues Tourism 2021;24(7):1003–16.
[16] University Planning and Statistics. Staff employment and student enrolment dataset. Melbourne, Australia: Monash University; 2021.
[17] Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap) - a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform 2009;42(2):377–81.
[18] von Elm E, Altman DG, Egger M, et al. The STrengthening the Reporting of OBservational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Lancet 2007;370(9596):1453–7.
[19] Heywood AE, Watkins RE, Jamsirathaworn S, et al. A cross-sectional study of pre-travel health-seeking practices among travelers departing Sydney and Bangkok airports. BMC Publ Health 2012;12:321.
[20] Shou Y, Olney J. Assessing a Domain-Specific Risk-Taking construct: a meta-analysis of reliability of the DOSPERT scale. J Health Commun 2020;15(1):112–34.
[21] StataCorp. Stata statistical software: release 17. College Station, TX: StataCorp LLC; 2021.
[22] Harris PA, Taylor R, Thielke R, et al. The STrengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Lancet 2007;370(9596):1453–7.
[23] Lepp A, Gibson H. Tourist roles, perceived risk and international tourism. Ann Tourism Res 2003;30(3):606–24.
[24] Reichel A, Fuchs G, Uriely N. Perceived risk and the non-institutionalized tourist role: the case of Israeli student ex-backpackers. J Trav Res 2007;46(2):217–26.
[25] Leder K, Steffen R, Cramer J, Greenaway C. Risk assessment in travel medicine: how to obtain, interpret, and use risk data for informing pre-travel advice. J Travel Med 2014;22.
[26] Weinstein ND, Kvetil A, McCaul KD, et al. Risk perceptions: assessment and relationship to influenza vaccination. Health Psychol 2007;26(2):146–51.
[27] Janssen E, van Osch L, de Vries H, Lechner L. Measuring risk perceptions of skin cancer: reliability and validity of different operationalizations. Br J Health Psychol 2011;16(Pt 1):92–112.
[28] Sheeran P, Harris PR, Epton T. Does heightening risk appraisals change people’s intentions and behavior? A meta-analysis of experimental studies. Psychol Bull 2011;140(3):511–43.
[29] Harris C, Jenkins M, Glaser D. Gender differences in risk assessment: why do women take fewer risks than men? Judgm Decis Mak 2006;1:48–63.
[30] Lepp A, Gibson H. Tourist roles, perceived risk and international tourism. Ann Tourism Res 2003;30(3):606–24.