EJHC | European Journal of Health Communication

ISSN 2673-5903
ejhc.org

Article

Google or Call Mom?

DOI: 10.47368/ejhc.2026.101
2026, Vol. 7(1) 1-30

A Diary Study on the Health Information-Seeking Behaviour Among International Students

Janine Brill, **Veronika Karnowski**
Chair of Media Communication, Chemnitz University of Technology, Germany

Constanze Rossmann
Department of Media and Communication, Ludwig Maximilian University of Munich, Germany

Abstract
The number of students studying abroad has increased considerably in recent years. International students often face barriers to accessing health information, affecting their mental and physical well-being. Using a repertoire-based approach, this study extends previous research that mainly focused on individual sources, online information, or specific contexts. By expanding the media repertoire approach to include an interpersonal dimension and analysing the combination of search modes, intermediaries, channels, and sources, the study provides a comprehensive examination of international students' health information-seeking patterns in Germany, covering a wider range of topics. A two-week online diary study with 15 participants generated 102 search situations. Using a multilevel latent class analysis, the study is the first to examine health information repertoire types among international students, identifying Online Information Seekers and Online and Interpersonal Information Seekers. The findings reveal that online information is frequently used across a wide range of search purposes. Even for more serious health topics, participants relied more on lay information from the internet or trusted individuals than on health professionals. Among Online Information Seekers, the exclusive reliance on online sources warrants critical consideration, as it may reflect barriers to accessing health information and services. The study offers practical implications for target group–oriented health communication, considering varying sources and language preferences, including the introduction of dedicated health officers at universities.

Corresponding author:
Janine Brill: janine.brill@phil.tu-chemnitz.de

Keywords
Diary study, health information, repertoire approach, international students, multi-level latent class analysis.

The number of international students worldwide has significantly increased in recent years, reflecting a broader trend among young people seeking educational opportunities abroad (Forbes-Mewett & Sawyer, 2016). During the winter semester of 2024/2025, Germany witnessed a record influx of international students, with approximately 90,000 new enrollees, bringing the total number to over 400,000 (DAAD, 2024; Mediendienst Integration, 2025). One-third choose to remain in Germany after their studies (Destatis, 2022). With the growing number of international students, addressing and raising awareness of their specific health information needs and practices has become increasingly important (Russell et al., 2008).

International students constitute a young subgroup of first-generation immigrants with diverse cultural and linguistic backgrounds. They frequently encounter challenges, including financial difficulties, limited communication with family members and friends in their home countries, homesickness, language barriers, and experiences of discrimination (Ambrósio et al., 2017; Carter et al., 2017; Forbes-Mewett & Sawyer, 2016; Gautam et al., 2016; Khoshlessan & Das, 2017; Newton et al., 2021; Reilly, 2013; Udah, 2021; Udah & Francis, 2022; Yoon & Kim, 2014). These challenges occur during a critical life stage when the risk of developing mental health issues is at its peak, often resulting in heightened levels of anxiety and depression (Carter et al., 2017; Forbes-Mewett & Sawyer, 2016; Rosenthal et al., 2008; Udah & Francis, 2022). International students report lower life satisfaction, reduced perceived social support, and less satisfaction with their environmental circumstances, along with greater adjustment problems compared to domestic students (Russell et al., 2009; Skromanis et al., 2018). Related mental health challenges can impact their physical health, work, academic performance, and relationships (Udah & Francis, 2022; Van Agteren et al., 2019). Stress and mental health issues are associated with emotional eating, poor nutrition, reduced physical activity, and increased body mass (Hill et al., 2021; Konttinen et al., 2010; Schuch et al., 2019; Ströhle, 2009). These issues become even more pressing as international students frequently encounter barriers to accessing health information and services (Sherry et al., 2010; Smith & Khawaja, 2011).

Previous research has largely focused on individual health information sources utilised by international students (e.g., Yoon & Kim, 2014), leaving a substantial gap in understanding their information patterns across multiple sources (repertoires), as well as the language and origin of these sources and the health information they search for. Given the likely diversity in their repertoires, developing tailored communication strategies is essential to effectively address this population. Therefore, this study aims to examine the health information sought and the repertoire types among international students in Germany, along with the language and origin of their information sources, to gain a comprehensive understanding of their information behaviour and to determine how to reach them efficiently.

Health Information Sought Among International Students

Previous research has primarily focused on the general immigrant population within a given country or on other subgroups, such as older immigrants, refugees, particular ethnicities or genders (e.g., Chae et al., 2021; Emtell Iwarsson et al., 2019; Gewalt et al., 2018; Goodman et al., 2018), leaving a considerable gap in understanding the health-related topics that international students search for. Nevertheless, some insights can be drawn from prior studies, indicating that they seek health information on mental health issues, physical symptoms and illnesses, medical treatments, gynaecology and sexual health, as well as diet and fitness (e.g., Ahmadinia et al., 2022; Martin & Dyer, 2017; Skromanis et al., 2018; Waldman et al., 2018; Yoon & Kim, 2014). Furthermore, international students search for information regarding insurance, medication and healthcare providers, such as local offices, hospitals and consultation hours (e.g., Yoon & Kim, 2014).

The health information needs of immigrants are highly diverse and shaped by individual contexts (Ahn & Chae, 2018; Misra et al., 2006). International students, as a distinct subgroup of first-generation migrants, have specific health information requirements shaped by their sociodemographic characteristics—typically being young, highly educated, financially constrained, and in good health—and their particular health-related interests and needs. These characteristics set them apart from other migrant populations, such as older migrants or refugees, who have distinct health information needs—e.g., due to higher age, poorer perceived health, greater prevalence of chronic illnesses, different migration experiences, and differing health concerns (e.g., Ahmadinia et al., 2022; Berens et al., 2020; Carruthers & Oakeshott, 2019; Goodman et al., 2018; Kleinert et al., 2019; Misra et al., 2006; Yilmaz et al., 2022). Given that, particularly in Germany, research on the health topics that international students seek information on remains limited, we first ask:

RQ1: What health information do international students in Germany search for?

Health Information-Seeking Behaviour of International Students

Individuals typically acquire information through two distinct strategies: information seeking and scanning (Waters et al., 2016). Information scanning refers to passive and unintentional encounters with information, while information seeking involves active and intentional searches for information, typically from various sources (Powe, 2015; Waters et al., 2016; Wong, 2012). Information seeking is defined as a problem-focused strategy that enables individuals to comprehend, evaluate, manage, and cope with health-related challenges and stressors (Clark, 2005; Lambert & Loiselle, 2007). For this study, health information seeking is defined as participants' active, intentional, and deliberate pursuit of health information to cope with health challenges.

In their search for health information, individuals typically employ a combination of behavioural processes and resources, drawing upon multiple information sources (Halder et al., 2010). Initially, they utilise various *search modes*, including electronic devices, traditional mass media and face-to-face communication (Chae et al., 2021; Christancho et al., 2014; Halder et al., 2010; Islam et al., 2016). This study defines search modes as approaches or strategies individuals initially adopt when seeking health information (e.g., reaching for their mobile phone vs. approaching someone face-to-face). The utilisation of these search modes facilitates access to specific *sources*, including websites, television channels, or interpersonal contacts (Ahn & Chae, 2018; Chae et al., 2021; Christancho et al., 2014; Halder et al., 2010; Islam et al., 2016). When using electronic devices, sources are often accessed through *intermediaries*, such as search engines, enhancing the efficiency and comprehensiveness of the search process by guiding users toward relevant online information (Cool & Belkin, 2011; Ellis et al., 2002; Marchionini, 1995), or through communication *channels* enabling information transmission and exchange between individuals, such as phone calls, emails, social networks or messaging services (Ahn & Chae, 2018; Christancho et al., 2014; Fabiano et al., 2020; Jia et al., 2021; Verčič & Špoljarić, 2020).

Most studies investigating the health information-seeking behaviour of international students have focused on electronic devices, online information (e.g., Bahl et al., 2022; Braun et al., 2023; Waldman et al., 2018; Yoon & Kim, 2014), or counselling services (e.g., Kearney et al., 2005; Masai et al., 2021; Russell et al., 2008), while neglecting other relevant search modes and sources. Moreover, some studies have examined their information behaviours within specific health contexts, such as mental health (e.g., Braun et al., 2023) or vaccination (e.g., Tung et al., 2022), without considering their information-seeking practices across a broader range of health topics. Nevertheless, valuable insights into their health information-seeking behaviour can be derived from these studies.

Prior studies have demonstrated that—other than for other immigrant populations (e.g., Chae et al., 2021; Christancho et al., 2014; Islam et al., 2016)—traditional mass media, such as newspapers, television, and radio, seem less significant for international students (e.g., Waldman et al., 2018; Yoon & Kim, 2014). Instead, they frequently utilise electronic devices to search for health information, particularly from online sources or apps, which is attributed to their generally high use of the internet and their greater comfort level with technology (e.g., Waldman et al., 2018; Yoon & Kim, 2014). These online sources are often accessed through intermediaries, particularly Google (e.g., Schäfer et al., 2021; Tung et al., 2022; Waldman et al., 2018). Furthermore, international students are more likely to seek advice from interpersonal sources through communication channels, such as messengers, email or phone calls, than the general (youth) population, who may prefer in-person consultations due to greater comfort and better access to such interactions (e.g., Waldman et al., 2018). Studies indicate that international students frequently seek health advice from trusted individuals, such as family members, friends, or acquaintances (e.g., Braun et al., 2023; Yoon & Kim, 2014). Community organisations, such as churches, community centres, and university health centres, are also valuable sources of health information for some (e.g., Skromanis et al., 2014; Yoon & Kim, 2014). Findings regarding the role of health professionals present a mixed picture. Some studies suggest that international students occasionally consult health professionals, utilise (university) health counselling services and express satisfaction with the services provided (e.g., Braun et al., 2023; Masai et al., 2021; Russel et al., 2008; Yoon & Kim, 2014). Other studies have shown that international students underutilise and express lower satisfaction with health counselling services (e.g., Martin & Dyer, 2017; Newton et al., 2021; Schäfer et al., 2021).

Although previous studies offer some insights into the health information behaviour of international students, most have concentrated on health information within digital spheres or focused on information behaviours in specific health contexts, leaving a gap in understanding their use of various search modes, intermediaries, channels, and sources across a broader range of health topics. Given the paucity of research providing a comprehensive examination of international students' health information behaviour, particularly in Germany (e.g., Braun et al., 2023; Schäfer et al., 2021), we pose the following question:

> *RQ2:* What search modes, intermediaries, channels, and sources do international students in Germany use when searching for health information?

Information Repertoires

Individuals utilise various sources to search for information (Chen et al., 2014), which they synthesise into coherent patterns, referred to as *repertoires* (Bachl & Mangold, 2017). A repertoire is "a set or stock of behaviours, skills, tactics, or work that an actor regularly or habitually performs" (Chen et al., 2014, p. 2553). The media repertoire approach (Hasebrink & Popp, 2006) focuses on the range of traditional and digital media that individuals habitually use. Regarding health information, it is crucial to consider both media sources and (face-to-face communication with) interpersonal sources, such as peers, family members, or caregivers (Bachl & Mangold, 2017; Baumann et al., 2020; Fisse et al., 2023; Reinhardt et al., 2021). Therefore, we adopt the term *information repertoires*, encompassing both media and interpersonal information sources.

In their daily lives, individuals may initially use their mobile phones to Google physical symptoms they are experiencing and, throughout the day, call a friend to seek health advice related to those symptoms, eventually deciding to consult a health professional. This example illustrates the considerable variability in information-seeking behaviour exhibited by one individual across different situations within their daily life, pointing out intra-individual variation (Karnowski et al., 2024). Therefore, intra-personal variance in searching for health information can be observed as distinct (*situation-level*) *search types*. Simultaneously, differences can be observed between individuals. Some may rely exclusively on electronic devices and online sources for health information, while others may heavily depend on advice from family members and friends via face-to-face communication or communication channels. This intra-personal heterogeneity in using search modes, intermediaries, channels and sources is reflected in distinct (*person-level*) *health information repertoires*. Researchers have noted a lack of studies examining the similarities and differences in health information patterns among international students, suggesting the existence of distinct repertoires (e.g., Yoon & Kim, 2014). Previous studies have often defined repertoires based on the use of sources without considering the search modes, channels, or intermediaries involved in search patterns. However, it makes a significant difference, for example, whether health professionals are consulted through digital communication channels or in face-to-face interactions. A comprehensive investigation of an individual's information-seeking behaviour over an extended period facilitates examining this behaviour at both the situational and person level. To analyse search types utilised by our participants at the situational level and to identify distinct repertoires at the person level, we pose the following question:

> *RQ3:* What (situation-level) search types and (person-level) health information repertoires can be identified among international students in Germany?

Scholars posit that information-seeking behaviour is contingent upon an individual's social and cultural context (Derose & Varda, 2009; Hepp & Hasebrink, 2014, 2017; Lee et al., 2023). This context changes as a result of migration (Berry, 2022; Elhami, 2020; Nauck, 2008; Ozer, 2013; Wang & Yu, 2015). When individuals migrate to another country and adopt the cultural norms of their new environment, they undergo a process of acculturation (Berry, 2022). Changes in language and origin of information sources are crucial in this process (Wang & Yu, 2015). Consequently, migration and acculturation can lead to the use of distinct search strategies, particularly regarding the origins and languages of the sources utilised. Different sources may be consulted in distinct languages, suggesting that the origins and languages of information may differ across the sources employed. As intra-personal variation in health information-seeking behaviour can manifest as distinct situation-level search types, variation may also be observed in language and origin of the respective sources. For instance, online searches—as a potential search type—may be more likely to be conducted in an individual's mother tongue and constitute a source from their home country, whereas healthcare professionals in the host country may be consulted in the host society's language. It is particularly valuable to examine language and origin differences regarding potential interpersonal search types to determine whether international students feel more comfortable seeking information from individuals from their home country or Germany and in which language(s) they prefer to engage in such interactions. Examining variation in language and source origin across different search types is particularly relevant to uncover potential barriers and develop communication strategies that account for diverse information sources and corresponding language and origin preferences. Therefore, we conclude by asking:

> *RQ4:* Are there differences between the (situation-level) search types (RQ3) regarding the origin and language of health information?

Method

Study Design

To address the research questions and observe behavioural patterns in participants' daily routines (Möhring & Schlütz, 2010), a two-week online diary study was conducted using SoSci Survey in July and August 2022 with fifteen international students in Germany. Participants could complete the study in German or English, with all respondents opting for English. Before commencing the study, each participant attended a 20-minute training session, during which they were thoroughly informed about the study's objectives, procedures, their rights, and data handling. The training session also aimed to familiarise participants with the study's requirements and ensure reliable survey completion at approximately the same time each day. Additionally, participants received a daily reminder email at the end of each day throughout the study period. Participation was entirely voluntary, and all participants provided their consent by confirming a declaration of consent. Data collection and processing adhered to applicable data protection regulations.

Participants

Participants were recruited through lectures, mailing lists of five German universities' international offices, and social media accounts of seven international student associations in Germany. The sample comprised students who had arrived in Germany no earlier than the summer semester of 2021, planned to stay long-term, and possessed proficient skills in English or German to facilitate their participation. In line with this study's definition of health information seeking, steps were taken to eliminate potential biases by confirming that no participant was enrolled in a health-related degree programme. This ensured that searches reflected participants' health concerns or those of their social environment rather than academic purposes lacking personal relevance. Nineteen students responded to the calls, two of whom were excluded from the study as they were exchange students. Two others did not follow up after the initial contact. After recruitment, each of the fifteen participants was assigned a unique serial number and a pseudonym corresponding to their country of origin (see Table 1). After completing the study, no participants had to be excluded, as all had engaged in health information-seeking during the survey period and had reliably completed the daily survey.

The study included eight female and seven male students, with an average age of 28 years ($M = 27.7$, $SD = 5.2$), all originating from non-European countries (see Table 1 for an overview). Nine participants were raised bilingual or multilingual, with the most frequently cited first languages being Hindi and English. Other first languages spoken included (Moroccan) Arabic, Russian, Cantonese, Mandarin, Punjabi, Urdu, Spanish, Portuguese, French, Assamese, and Malayalam.

Table 1. Information on the Participants

Pseudonym	Gender	Age	Country of origin	Length of residency (in months)	German language proficiency	Perceived health status	Chronic disease
Ramesh	male	22	India	6	Beginner (A1)	Fair	No
Uma [a]	female	25	Pakistan	15	Beginner (A1)	Poor	No
Alex	male	36	Australia	10	Elementary (A2)	Good	No
Aya	female	23	Morocco	11	Beginner (A1)	Good	No
Jessica	female	30	Ghana	12	Beginner (A1)	Good	Yes
Priya	female	32	India	15	Proficiency (C2)	Very good	No
Daria [a]	female	23	Russia	10	Elementary (A2)	Good	No
Mei	female	29	Hong Kong	10	Intermediate (B1)	Good	No
Ravi	male	21	India	3	Beginner (A1)	Very good	No
Emanuel	male	31	Brazil	9	Intermediate (B1)	Good	No
Tayo	male	38	Nigeria	4	Elementary (A2)	Very good	No
Sofia	female	22	Argentina	9	Advanced (C1)	Good	No
Tarak	male	30	India	12	Elementary (A2)	Good	No
Santosh	male	27	India	4	Beginner (A1)	Good	No
Alani	female	27	India	7	Intermediate (B1)	Good	No

Note. All names in the table are pseudonym names according to the participants' country of origin. [a] Acute illness at the beginning of the diary study.

The participants demonstrated advanced English language proficiency. Their German language skills were predominantly at an A or B level, with two participants achieving C-level proficiency. The students had an average residency of nine months in Germany at the start of the study ($M = 9.1$, $SD = 3.7$). Five participants held a Master's degree, eight had a Bachelor's degree, and one had completed secondary education.

The participants predominantly perceived their health as either good or very good, with only one participant each rating their health as fair or poor. At the start of the online diary study, two participants reported having an acute illness, while one participant was managing a chronic illness. Additionally, 12 participants indicated that someone in their immediate social environment suffers from a chronic illness.

Operationalisation

The diary study assessed participants' health information-seeking behaviour on a given day. If they searched for information more than once a day, we collected information on up to seven searches. Each search was queried individually by inquiring about the search modes, channels, intermediaries, and sources used step-by-step using filters, beginning with selecting one of thirteen distinct search modes (see Figure 1 for an overview).

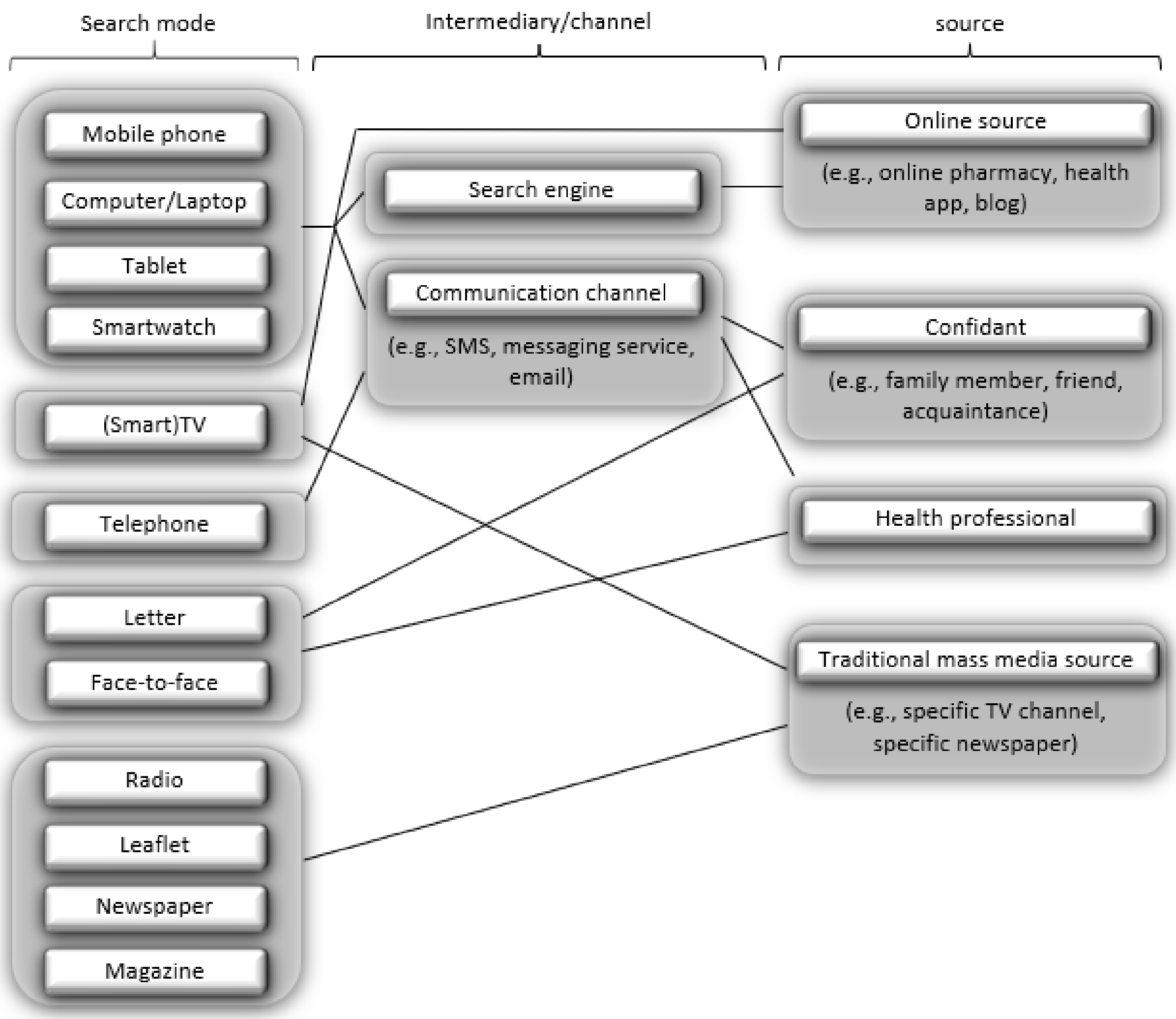

Figure 1. Simplified Illustration of the First Path of the Survey

The search modes included five electronic devices (mobile phone, telephone, computer/laptop, smartwatch, tablet), seven traditional media (newspaper, TV, radio, magazine, leaflet, book, letter), and face-to-face communication (Chae et al., 2021; Christancho et al., 2014; Islam et al., 2016; Reinhardt et al., 2021; Skarpa & Garoufallou, 2021). If participants used a newspaper, radio, magazine, leaflet or book as a search mode, they were asked to specify the particular traditional mass media source, such as the specific newspaper or radio channel, they consulted. For those who utilised a (smart) television as a search mode, participants were asked to identify the particular TV channel, streaming service, or application they employed. Those who used a mobile phone, computer/laptop, tablet or smartwatch as a search mode were asked whether they employed a web browser, an intermediary, i.e. a search engine, a communication channel, or any other app (e.g., Chae et al., 2021; Jia et al., 2021; Reinhardt et al., 2021; Shaw & Johnson, 2011; Skarpa & Garoufallou, 2021). Communication channels included messaging or video call apps (e.g., WhatsApp, Telegram, Zoom), social network apps (e.g., Facebook, Instagram), or email, while other apps included streaming services (e.g., Netflix), audio streaming services (e.g., Spotify), or any other app (Chae et al., 2021; Jia et al., 2021; Reinhardt et al., 2021; Shaw & Johnson, 2011; Skarpa & Garoufallou, 2021). If participants indicated using a messaging or video call application, we asked them to specify the platform they utilised (e.g., WhatsApp, Telegram). Similarly, for social networking sites, participants were asked to identify whether they used Facebook, Twitter/X, Instagram, TikTok, Snapchat, or any other social network. Participants who consulted web sources—whether directly using a web browser or through a search engine—were asked to specify the source, including health-related specialised sources (e.g., health portals, online pharmacies) and non-specialised sources (e.g., online encyclopedias, blogs) (Baumann et al., 2020; Chae et al., 2021; Reinhardt et al., 2021; Schäfer et al., 2021; Shaw & Johnson, 2011; Wang & Yu, 2015). When using letters, a telephone or face-to-face communication as a search mode, or any communication channel, we inquired about the specific interpersonal sources they turned to, including health professionals (e.g., doctors, pharmacists, nurses, therapists), family members, partners, friends, acquaintances (e.g., colleagues, neighbours, fellow students), or any other individuals (Baumann et al., 2020; Chae et al., 2021; Reinhardt et al., 2021; Shaw & Johnson, 2011; Wang & Yu, 2015).

Additionally, the study assessed the language in which the information was sought and received, categorising it into first language, German, English, or another (e.g., Islam et al., 2016; Yoon & Kim, 2014). We also evaluated the sources' country of origin, classifying it as from the home country, Germany, another country, or unknown (e.g., Nölke et al., 2015; Islam et al., 2016; Wang & Yu, 2015). Participants were asked to specify for whom they searched for health information, including themselves, family members, partners, friends, acquaintances, or others (e.g., Ahn & Chae, 2018; Baumann et al., 2020; Ghaddar et al., 2011; Yoon & Kim, 2014)[1]. Finally, participants provided open-ended responses to describe the health information they searched for. This was essential due to the diverse and complex nature of health issues, which often require a broad range of information (Ahmadinia et al., 2022; Ahn & Chae, 2018; Misra et al., 2006).

A preliminary survey was conducted to assess the socio-demographic characteristics of the participants, including age (open evaluation; e.g., British National Corpus, 2018; Yilmaz, 2020), gender (female, male, other; adjusted from the European Social Survey, 2020), the highest level of education (some high school, high school degree, Bachelor's degree, Master's degree, PhD degree or higher; adapted from the American Community Survey, 2023), country of origin (open evaluation; e.g., British National Corpus, 2018; Skromanis et al., 2018), length of residency in months (open evaluation; e.g., British National Corpus, 2018; Lönnqvist et al., 2015) and field of study (open evaluation; e.g., Skromanis et al., 2018). Data were collected on the participants' health, encompassing their self-reported health status using the Self-Reported Health (SRH) Scale ("In general, how would you rate your overall health?") with options of very good, good, fair, poor and very poor (e.g., Balaj, 2020), the presence of chronic or acute illnesses (yes, no; e.g., Eurostat, 2010), and the prevalence of chronic illnesses in their immediate social environment (yes, no; adjusted from Eurostat, 2010). If participants or someone in their immediate social circle had been diagnosed with a chronic illness, we asked whether the condition had manifested within the past twelve months (yes, no; e.g., Eurostat, 2010). Additionally, we collected information about the participants' language proficiencies, including their first language(s) (open evaluation, e.g., British National Corpus, 2018) and their levels of German and English, assessed using the Common European Framework of Reference for Languages (CEFR) levels (see Council of Europe, 2024), ranging from A1 (Beginner) to C2 (Proficiency). Participants were also asked to indicate any other languages they spoke (open evaluation; e.g., British National Corpus, 2018).

Data Analysis

The open-ended responses related to the sought-after information were analysed using content analysis (RQ1). This analysis employed an inductive-deductive categorisation approach, drawing on the findings of prior research (e.g., Ahmadinia et al., 2022; Martin & Dyer, 2017; Skromanis et al., 2018; Yoon & Kim, 2014). The categorisation on and code system development (see Appendix A) were conducted by a researcher involved in this study, yielding twelve distinct categories representing the health-related topics participants searched for. To ensure the reliability of the coding process, intercoder reliability tests were conducted on the entire dataset (n = 102 open-ended responses) with two experienced coders—one researcher involved in the study and one independent coder. Several coding training sessions were held before this. In cases of ambiguity or discrepancy, the relevant category was discussed, and the codebook was revised for greater clarity. This process yielded an inter-coder reliability of $\kappa = 0.87$. These high reliability scores indicate a strong agreement between coders, reinforcing the credibility of the data coding process.

Statistical Analysis

To address RQ1 and RQ2, the frequencies of sought health information (RQ1) and search modes, intermediaries, channels, and sources used (RQ2) were calculated. To address RQ3, given the hierarchical structure of our data with multiple health information situations (n = 102) nested within participants (n = 15), specialised statistical methods were necessary to account for the non-independence of the data (Karnowski et al., 2024). Latent class analysis allows for identifying clusters of homogeneous units of the clustering variables. This method operates under the assumptions of local independence and the existence of a discrete variable with K categories that induces homogeneity among the clustered units (Karnowski et al., 2024; Lazarsfeld & Henry, 1968). Given the multilevel structure of our dataset, we conducted a multilevel latent class analysis (Lukočienė et al., 2010) using Latent GOLD 6.0 (Vermunt, 2008; Vermunt & Magidson, 2020). This approach enabled us to identify situation-level clusters, i.e. search types (Level 1/L1; 102 situations), and person-level clusters, i.e. repertoires (Level 2/L2; 15 participants). To adequately address the multilevel structure of the data, it is advisable to incorporate a group-level discrete latent variable (in this case, a person-level latent variable) and allow model parameters to vary across different latent classes of individuals (Karnowski et al., 2024; Vermunt, 2008). This approach implies that each participant can be classified into one of L person-level latent classes, with individual j belonging to a specific person-level latent class l (Karnowski et al., 2024; Vermunt, 2008). These person-level latent classes may exhibit variations in the likelihood that an individual's situations belong to the situation-level latent class k (Karnowski et al., 2024). In our study, we implemented the three-step procedure by Lukočienė et al. (2010) to identify the optimal model. First, the number of situation-level classes is estimated (with one GClass). In the next step, the number of person-level classes (GClasses) is estimated with a fixed number of situation-level classes estimated in the first step. Lastly, the situation-level classes are redetermined with a fixed number of person-level classes estimated in the second step (Karnowski et al., 2024; Lukočienė et al., 2010). The essential dimensions of search modes, intermediaries, channels, and sources were employed to calculate situation-level search clusters (L1). The variable comprising the participants' serial numbers was used to calculate person-level repertoires (GClasses on L2, i.e., classes on the person level). To address RQ4, Chi² tests were conducted to identify differences between the (situation-level) search types regarding sources' (country of) origin and language.

Results

On average, participants searched for health information on six days ($M = 5.6$, $SD = 2.8$), conducting seven searches ($M = 6.8$, $SD = 3.9$) over the fourteen-day study period. In most cases (71%, $n = 70$), information was sought in the participants' mother tongue. English (21%, $n = 21$) was also frequently used among those who did not indicate English as one of their native languages. Only a few searches were conducted in German (11%, $n = 11$). Participants received information in similar languages, with 68% ($n = 69$) being received in their mother tongue, 20% ($n = 20$) in English, and 12% ($n = 12$) in German. Most sources were of unknown origin or from countries other than Germany or the participant's home country (53%, $n = 54$). German sources were consulted slightly more frequently (28%, $n = 28$) than home country sources (20%, $n = 20$). 80% of searches ($n = 78$) were conducted for the participants themselves; 26% ($n = 26$) on behalf of others. In cases of proxy searches, participants primarily searched for friends (62%, $n = 16$). Searches for acquaintances (19%, $n = 5$), family members (12%, $n = 3$), or their partners were less common (8%, $n = 2$).

Searched Health Information (RQ1)

Concerning the searched health information (RQ1), a content analysis of the open-ended responses identified twelve topics that participants searched for, which were consolidated into five main categories (see Table 2). Most searches were related to (the treatment of) health issues, particularly (the treatment of) physical symptoms (e.g., „home remedies for a sore throat"), general information about illnesses (e.g., „Diabetes"), and medication (e.g., „I asked about which medicines to take for my stomach"). Female participants frequently sought information on gynaecological and sexual health (e.g., „effect of contraceptive pills on fertility"). Participants also searched for information related to fitness, physical activity, and measurement (e.g., „I checked the heart rate and the number of steps throughout the day"), as well as diet and nutrition (e.g., „healthy diet plan"). Healthcare-related searches, such as for nearby health services (e.g., "I searched for a nearby dentist on Google Maps"), were less common.

Search Modes, Intermediaries/Channels, and Sources Used (RQ2)

RQ2 addressed the question of which search modes, intermediaries, channels, and sources are used by international students. The results show that electronic devices, especially mobile phones, were the most used search modes (see Table 3). Some participants engaged in face-to-face conversations—mainly with confidants (8%, *n* = 8) rather than health professionals (2%, *n* = 2). Traditional media, such as leaflets or television, played a minor role in their searches.
Search engines were frequently used as intermediaries (37%, *n* = 38). Communication channels, including phone calls (8%, *n* = 8) and messaging services like WhatsApp or Google Meet (7%, *n* = 7), were less often used.

Information sources accessed through these search processes were mainly health-related specialised online sources, including health apps, online pharmacies and health portals, and non-specialised online sources, such as blogs, YouTube, and Q&A forums (see Table 4). Health advice was also frequently sought from interpersonal sources, with confidants such as family members and friends being consulted more often than health professionals. Traditional mass media sources, such as specific TV channels, were the least commonly used source.

Situation-Level Search Types and Person-Level Repertoire Types (RQ3)

To identify situation-level search types and person-level repertoire types among the participants (RQ3), following the three-stage multilevel latent class analysis procedure (Lukočienė et al., 2010), the first step involved calculating the situation-level search clusters, testing one-to-ten-class solutions with a single person-level class (1GClass). The two-class solution was the optimal model fit based on the Bayesian Information Criterion (BIC) (see Table 5).

Table 2. Searched Health Information

Health Topic	*n*	%
(Treatment of) Health issues	54	54
(Treatment of) Symptoms	20	20
General information about illnesses	13	13
Medication	9	9
COVID-19	6	6
Mental health	3	3
Medical treatments	3	3
Gynaecology and sexual health	16	16
Fitness, physical activity and measurement	13	13
Diet and nutrition	11	11
Healthcare	8	8
Medical appointment	3	3
Search for nearby health services	3	3
Health insurance	2	2
Total	102	100

Table 3. Search Modes

Search mode	*n*	%
Electronic device	89	87
Mobile phone	54	53
Computer or laptop	26	26
Smartwatch	8	8
Tablet	1	1
Face-to-face communication	10	10
Traditional mass media	3	3
Leaflet	2	2
TV	1	1
Total	102	100

Table 4. Health Information Sources

Information source	*n*	%
Health-related specialised online source	47	46
Health app	11	11
Online pharmacy	10	10
Health portal	8	8
Smartwatch information	8	8
Website of a medical practice or hospital	7	7
Another online source	3	3
Non-specialised online source	28	27
Blog	11	11
Another online source	6	6
YouTube	5	5
Q&A forum	4	4
Online encyclopedia (Wikipedia)	1	1
Social Network (Reddit)	1	1
Confidant	17	17
Family member	8	8
Friend	7	7
Acquaintance	2	2
Health professional	7	7
Traditional mass media sources	3	3
Leaflet (from a medical institution)	2	2
TV Channel (CNN)	1	1
Total	102	100

Table 5. Information Criteria For Cluster Solutions

Model	Number of classes	LL	BIC	AIC	AIC3	Npar	Max. BVR	VLMR	*p*-value	Class. Error	Entropy
1	1-Cluster 1GClass	-373,31	802,12	770,62	782,62	12	7,60	–	–	0,000	1,00
2	2-Cluster 1GClass	-318,07	751,77	686,14	711,14	25	2,45	110,48	0,00	0,001	0,986
3	3-Cluster 1GClass	-296,58	768,90	669,15	707,15	38	1,13	42,99	0,00	0,000	0,999
4	4-Cluster 1GClass	-281,20	798,28	664,40	715,40	51	0,78	30,75	0,00	0,053	0,899
5	5-Cluster 1GClass	-274,39	844,78	676,78	740,78	64	0,15	13,62	0,00	0,053	0,907
6	6-Cluster 1GClass	-272,46	901,06	698,93	775,93	77	0,07	3,84	0,11	0,059	0,901
7	7-Cluster 1GClass	-271,27	958,79	722,54	812,54	90	0,02	2,39	0,21	0,155	0,789
8	8-Cluster 1GClass	-271,15	1018,67	748,30	851,30	103	0,02	0,24	0,00	0,209	0,721
9	9-Cluster 1GClass	-271,05	1078,61	774,11	890,11	116	0,02	0,19	0,00	0,234	0,679
10	10-Cluster 1GClass	-270,98	1138,58	799,96	928,96	129	0,01	0,15	0,00	0,250	0,650
11	2-Cluster 1GClass	-318,07	751,77	686,14	711,14	25	2,45	–	–	0,001	0,986
12	2-Cluster 2GClass	-315,41	755,69	684,82	711,82	27	2,45	5,32	0,01	0,001	0,988
13	2-Cluster 3GClass	-315,29	764,71	688,58	717,58	29	2,45	0,24	0,00	0,001	0,988
14	2-Cluster 4GClass	-315,24	773,86	692,48	723,48	31	2,45	0,10	0,00	0,001	0,988
15	2-Cluster 5GClass	-315,21	783,05	696,43	729,43	33	2,45	0,06	0,00	0,001	0,988
16	2-Cluster 6GClass	-315,20	792,27	700,39	735,39	35	2,45	0,03	0,00	0,001	0,988
17	2-Cluster 7GClass	-315,19	801,49	704,37	741,37	37	2,45	0,02	0,01	0,001	0,988
18	2-Cluster 8GClass	-319,33	819,03	716,65	755,65	39	3,75	-8,28	0,92	0,028	0,892
19	2-Cluster 9GClass	-315,17	819,96	712,34	753,34	41	2,45	8,31	0,08	0,001	0,988
20	2-Cluster 10GClass	-315,17	829,20	716,33	759,33	43	2,45	0,01	0,02	0,001	0,988

Note. 15 participants, 102 situations. LL = log likelihood, BIC = Bayesian information criterion based on the number of situation-level cases, AIC = Akaike information criterion based on the number of situation-level classes, Npar = number of parameters, BVR = Bivariate residuals, VLMR = Vuong-Lo-Mendell-Rubin statistic. Procedure based on Lukočienė et al. (2010).

Subsequently, the two situation-level clusters were associated with one-to-ten-class solutions at the person level (1GClass to 10GClass). Based on the BIC, the 1GClass solution was identified as providing the best model fit. However, it is essential to select the optimal model not solely based on the lowest BIC value. It may be more appropriate to consider a model with a slightly higher BIC, particularly if it offers greater interpretability or if other fit metrics indicate that it provides a more suitable solution. In this case, the 2-Cluster 1GClass solution would not be the best fit to identify distinct repertoires among participants. Given the proximity of the lowest (2-Cluster 1GClass) and second lowest (2-Cluster 2GClass) BIC values, along with the minimal differences in other fit metrics, which favour the 2-Cluster 2GClass solution, and considering its superior interpretability, we opted for the 2-Cluster 2GClass model. Consequently, two repertoire types were identified at the person level.

Using the 2-Cluster 2GClass solution, we first identified the clusters of *Online Searches* and *Interpersonal Searches* at the situation level (see Table 6). *Online Searches* account for approximately 72% of the total searches and are conducted exclusively through electronic devices. There is a 49% probability of a search engine being utilised as an intermediary during these searches. This search pattern leads to using specialised (55%) or non-specialised online sources (45%). The search cluster of *Interpersonal Searches* accounts for approximately 28% of the total searches. In this cluster, the probability of using electronic devices as search modes is 54%. It is characterised by a higher likelihood of face-to-face searches (35%) and using traditional mass media (11%) as search modes. Phone calls (28%) and messaging services (25%) are likely to be used as (communication) channels. The cluster is predominantly characterised by interactions with interpersonal sources, particularly with confidants (63%) rather than health professionals (25%). Additionally, the likelihood of utilising traditional mass media sources, such as specific television channels or leaflets, in this cluster is 11%.

The 2-Cluster 2-GClass model indicates that participants can be classified into two distinct health information repertoire types: *Online and Interpersonal Information Seekers* (78%, $n = 12$) and *Online Information Seekers* (22%, $n = 3$). The latter predominantly rely on online searches, showing a high probability of using online sources while being unlikely to engage in face-to-face or traditional mass media searches. *Online and Interpersonal Information Seekers* also conduct online searches with a high probability but engage in interpersonal searches, likely consulting confidants for health information, and occasionally utilise traditional mass media.

Origin and Languages of Sources Used for Search Types (RQ4)

RQ4 examines the extent to which the identified search types differ concerning the origins and languages of the sources used. The findings show that the origins of sources of the situation-level search types of *Online Searches* and *Interpersonal Searches* vary significantly, $\chi^2(3) = 36.88$, $p < .001$, $V = .60$. *Online Searches* are likely to yield sources of unknown origin (58%, $n = 43$). When participants can identify the origin of online sources, they are more likely to originate from Germany (22%, $n = 16$) than from other countries (12%, $n = 9$) or their home countries (8%, $n = 6$). In contrast, the likelihood of retrieving sources from the home country (50%, $n = 14$) is roughly equal to obtaining sources from Germany (43%, $n = 12$) with *Interpersonal Searches*. The origin of sources used in this search type is unlikely to be unknown (7%, $n = 2$). This suggests that *Online and Interpersonal Information Seekers* seek advice from individuals from Germany and their home countries. In such cases, it is unlikely that the source is of unknown origin or originates from other countries. This pattern persists despite the possibility that international students might consult with fellow students from different countries experiencing similar issues.

The situation is different concerning the languages in which information is obtained. The languages are nearly evenly distributed and do not vary significantly between the search types, $\chi^2(3) = .35$, $p = .84$, $V = .06$. In *Online Searches*, information is most likely to be received in participants' mother tongues (68%, $n = 50$) with a slightly higher probability of receiving health information in English (22%, $n = 16$) than in German (11%, $n = 8$). Likewise, in *Interpersonal Searches*, health information is most likely obtained in the participants' mother tongue (68%, $n = 19$), less likely so in English (18%, $n = 5$) or German (14%, $n = 4$).

Table 6. 2-Cluster 2GClass Solution: Conditional Item Response Probabilities

	Situation-level class 1	Situation-level class 2
	Online Searches [a]	Interpersonal Searches
Person-level classes and items	%	%
Relative cluster size	*72*	*28*
(Person-level) Health information repertoires (and relative size of resp. classes) [b]		
Online and Interpersonal Information Seekers (78%)	64	36
Online Information Seekers (22%)	98	2
Search mode		
Electronic device	100	54
Face-to-face communication	–	35
Traditional mass medium	–	11
Intermediary/Channel		
None	49	47
Search engine	51	–
Phone call	–	28
Messaging service	–	25
Source		
Specialised online source	55	1
Non-specialised online source	45	1
Confidant	–	63
Health professional	–	25
Traditional mass media source	–	11

Note. 15 participants, 102 situations. Dimensions measured as single selection (categorical). [a] conditional probabilities per situation (search level), e.g. when belonging to situation class 1 (Online Searches), the likelihood of that situation involving an electronic device is 100%. 72% of the situations belong to search type 1. [b] conditional probabilities per group (person level), e.g. when belonging to repertoire type 1 (Online and Interpersonal Information Seekers), 63% of the health information situations are type 1 situations (Online Searches). 78% of our participants belong to repertoire type 1.

Discussion

This study employed a two-week online diary to comprehensively examine the health information behaviour of fifteen international students in Germany. Expanding beyond prior research primarily focused on individual sources, online health information, or specific health contexts, this study investigated the use of various search modes, intermediaries, channels, and sources across a broader range of health topics. Searched topics were mainly related to (the treatment of) health issues, particularly (the treatment of) physical symptoms, general information about illnesses, and medication (RQ1). Aligning with prior research (e.g., Waldman et al., 2018; Yoon & Kim, 2014), the findings highlight a tendency among international students to rely on mobile phones, search engines, and online sources for health information and show the limited role of traditional mass media (RQ2). The study also supports findings (e.g., Martin & Dyer, 2017; Skromanis et al., 2018) that confidants are frequently consulted for health information, while only a few participants sought advice from health professionals. Prior research indicates that face-to-face consultations with health professionals among immigrants tend to increase with age (Chae et al., 2021; Christancho et al., 2014) due to the higher likelihood of experiencing health issues or managing chronic illnesses (Bianchi & Tafuri, 2022). In this study, most participants rated their health as good or very good, but even those with acute or chronic illnesses, or those perceiving their health as fair or poor, reported not consulting health professionals but instead seeking information from trusted individuals.

Furthermore, this study addressed a research gap by examining how international students combine search modes, intermediaries, channels, and sources within their health information repertoires. The application of a multilevel latent class analysis enabled the identification of distinct patterns in combinations on the situation level (search types) and the person level (repertoire types) (RQ3). The findings suggest that international students exhibit heterogeneous health information repertoires (*Online Information Seekers* and *Online and Interpersonal Information Seekers*). The situation-level search types of *Online searches* and *Interpersonal searches* differ not only in the combination of search modes, intermediaries, channels, and sources but also in the origins of sources used (RQ4), with online searches frequently leading to sources of unknown origin and interpersonal searches being likely to involve sources from the participants' home countries or Germany.

The findings emphasise the relevance of considering both situational search behaviour and broader, person-level health information repertoires when analysing information practices. Neglecting the diversity and combination of information sources may lead to misinterpretations stemming from the examination of individual sources alone (Hasebrink & Domeyer, 2012; Fisse et al., 2023). While situational data may indicate that most students primarily rely on online sources, a person-level analysis reveals a more complex pattern. Most participants combined online and interpersonal searches, with some also utilising traditional mass media. However, some students exclusively sought health information online, which could be concerning if it reflects a habitual practice. Therefore, among *Online Information Seekers*, the exclusive reliance on online sources warrants critical consideration, as it may reflect barriers to accessing health information and services.

Regarding theoretical and methodological implications, these findings underscore the importance of incorporating repertoire-based, multi-level analyses in future research. The notable reliance on interpersonal sources suggests that the media repertoire approach should be expanded to include an interpersonal dimension to provide a more comprehensive understanding of individuals' information-seeking practices. In light of the ever-evolving media landscape and the rapid advancement of new technologies, it is essential to acknowledge the enduring importance of interpersonal communication, particularly face-to-face communication. Despite the proliferation of digital platforms and mediated interactions, direct personal communication remains a pivotal component of information-seeking behaviours. Neglecting this aspect risks omitting a vital source of health information from the analytical framework.

Furthermore, this study addresses the risks of marginalisation and stereotyping by focusing on a specific subgroup rather than treating immigrants as a homogeneous population, thereby contributing to a deeper understanding of their health information practices and informing targeted support measures. International students are in a highly vulnerable phase of their lives, during which they face an increased risk of developing mental health issues due to financial difficulties, academic pressure, limited contact with trusted individuals from their home country, and the need to adapt to a new living and (health) information environment (Ambrósio et al., 2017; Carter et al., 2017; Newton et al., 2021; Udah & Francis, 2022; Yoon & Kim, 2014). These challenges can lead to unhealthy behaviours, such as poor nutrition and reduced physical activity, contributing to physical health issues. Furthermore, international students are less likely to seek help for mental and physical health issues compared to domestic students—partly due to language barriers, cultural stigma, and a lack of awareness about available services (Forbes-Mewett & Sawyer, 2016; Sanci et al., 2022; Skromanis et al., 2018).

To address these challenges and support international students in accessing reliable health information and services, it is crucial to comprehensively examine their health information-seeking behaviour to develop tailored communication strategies, considering the diverse information channels and languages they use. The findings underscore that a universal communication strategy cannot effectively address the health information needs of international students. This has important implications for health communicators, including health professionals, universities, health counselling services, and international offices, all of whom play a role in disseminating health information that is accessible and relevant to international students: Given that online searches are the primary common factor among the repertoire types of *Online Information Seekers* and *Online and Interpersonal Information Seekers*, and to mitigate the reliance on non-specialised online sources, we recommend enhancing the availability of evidence-based, reliable online health information targeted at international students. Universities could introduce a website section offering health-related resources for international students, including general information about the healthcare system in the host country and region-specific guidance. Health information should be provided in English or, ideally, in multiple languages, considering that most searches in our study, as in other studies (e.g., Christancho et al., 2014; Islam et al., 2016; Yoon & Kim, 2014), resulted in health information in the participants' mother tongue. Medical terminology can be particularly challenging to comprehend in non-native languages. The internet offers the advantage of providing information in users' native languages, for example, through automatic website translation tools. This common practice for non-native speakers can effectively help reduce language barriers.

Furthermore, since participants often turn to trusted individuals for health advice, access to a trained, ideally multilingual health officer assigned by the university would be advantageous. Additionally, access to university health counselling services could provide vital support.

These resources can be especially beneficial during the early stages of migration, helping international students navigate healthcare in Germany. This includes assisting with health insurance and navigating local health services, such as referring international students to English-speaking medical practitioners. As providing health officers at universities is less common in Germany compared to other countries, their implementation would likely yield significant benefits. Considering that international students often turn to trusted individuals for advice, the positive experiences shared by fellow international students could also serve as an important factor in encouraging the use of such services (Russel et al., 2008).

Since the participants primarily searched for information related to (the treatment of) illnesses, it would be beneficial to seek such information more frequently from health professionals rather than relying predominantly on online sources. This is particularly relevant for *Online Information Seekers*, who relied exclusively on online sources for health information during the online diary study. However, even among *Online and Interpersonal Information Seekers*, health professionals were consulted less frequently than trusted (lay) persons. These findings may indicate barriers to accessing health services, highlighting the necessity of enhancing both the frequency and satisfaction with professional consultations by implementing culturally sensitive training for healthcare practitioners. Increasing the availability of English-speaking health professionals in Germany may address the language barriers that international students often face (e.g., Sanci et al., 2022), ultimately fostering better communication and care.

Given the limitations of this study, it is essential to exercise caution when interpreting our findings. We only recruited a few participants and focused on young, highly educated first-generation immigrants in Germany. The recruitment process resulted in a predominantly non-European sample. However, German universities have a greater proportion of non-European international students—particularly students from India, as in our sample (DAAD, 2024). Moreover, most participants perceived their health as good or very good. It is therefore possible that the health status and information behaviour were biased in favour of a comparatively healthy sample. Consequently, no definitive conclusions can be drawn regarding the health information-seeking behaviour of international students with (chronic) illnesses or a perceived health status of fair, poor, or very poor. Although no behavioural variations were observed between healthier and less healthy participants in the present study, perceived health status may nonetheless influence information-seeking practices (e.g., Schmidt et al., 2021). For instance, individuals in good health may be more inclined to seek information out of general interest (e.g., fitness, nutrition), whereas those with poorer health may engage in more problem-focused searching (e.g., symptoms, medical treatments), potentially searching for health information more often and consulting a wider range of sources, including healthcare professionals (e.g., Schäfer et al., 2021; Schmidt et al, 2021). Furthermore, the international students in this study reported only their general perceived health status, not their mental health status specifically. Including this information could have provided deeper insight into whether participants had little need for health information and services in this regard or faced barriers in accessing them. A broader sample comprising a greater number of chronically ill individuals or those who perceive their (mental and/or physical) health as fair, poor, or very poor is required to draw meaningful conclusions. Additionally, participants may have displayed atypical information-seeking behaviours due to their awareness of being involved in a study, despite being instructed to act as they normally would during the training before the study. Furthermore, the fourteen-day study duration offers only a limited insight into the health information-seeking behaviours of our participants. While it is strongly advised that diary studies do not extend beyond fourteen days (Möhring & Schlütz, 2010), conducting research over a longer period would provide a more comprehensive understanding.

To gain deeper insights into their health information-seeking behaviours, it is essential to utilise a variety of methods, including large-scale panel surveys and in-depth in-situ studies with a larger sample size and more diverse socio-demographic characteristics. Such studies may also include more individuals with chronic illnesses, as well as individuals from other countries that frequently serve as countries of origin for international students, such as Turkey, Austria, Italy, Iran, or Syria (Mediendienst Integration, 2025). However, the diary study allowed for the comprehensive collection of data on the everyday health information behaviour of international students, which is less susceptible to social desirability biases than other types of surveys (Möhring & Schlütz, 2010; Scherer & Naab, 2013; Wurdak et al., 2010) and produces data that is superior to that obtained from retrospective surveys, which are prone to recall bias (Scherer & Naab, 2013).

Despite these limitations, this study offers valuable insights into a sparsely researched subgroup of first-generation immigrants, particularly given the lack of studies examining the health information behaviour of international students in Germany. As demonstrated in this study, the health information behaviours of international students differ from those observed in research on immigrants more broadly or other immigrant subgroups, who tend to rely less strongly on online sources and engage more extensively with traditional mass media sources (e.g., Chae et al., 2021; Christancho et al., 2014; Islam et al., 2016). In contrast, international students strongly rely on mobile phones, search engines, and online sources for health information while showing limited engagement with traditional mass media. This is attributed to their generally high use of the internet and their greater comfort level with technology compared to other (older) immigrant populations (e.g., Waldman et al., 2018; Yoon & Kim, 2014). This underscores the need for a differentiated analytical perspective.

Examining information behaviour through a repertoire-based perspective, rather than isolating single information sources, has offered deeper insights into international students' health information-seeking behaviours. This approach highlights the complex interplay of various information patterns these students use to address their unique health information needs. Consolidating and deepening our findings in future research will help develop improved health information resources for international students, potentially enhancing their health information-seeking behaviour and contributing to better health outcomes.

Notes

1. Multiple answers were allowed for this question.

Funding

The authors state no funding is involved.

Conflict of Interest

The authors report that they have no competing interests to declare.

Ethical Approval

In this study, all participants were thoroughly informed about the study's objectives, procedures, their rights, and the handling of their data, both orally and in writing. Additionally, they received specific training, which also served to orally inform them about the study and the handling of their data, as well as to prepare them for the study's requirements. Participation was entirely voluntary, and all participants provided informed consent by signing a consent form. Data collection and processing were conducted in compliance with applicable data protection regulations.

References

Ahmadinia, H., Eriksson-Backa, K., & Nikou, S. (2022). Health-seeking behaviours of immigrants, asylum seekers and refugees in Europe: A systematic review of peer-reviewed articles. *Journal of Documentation, 78*(7), 18–41. https://doi.org/10.1108/JD-10-2020-0168

Ahn, J., & Chae, D. (2018). The influences of socio-individual determinants and health information seeking on health-promoting behaviours among migrant women: A cross-sectional study. *Japan Journal of Nursing Science*, *16*(4), 481–490. https://doi.org/10.1111/jjns.12259

Ambrósio, S., Marques, J., Santos, L., & Doutor, C. (2017). Higher education institutions and international students' hindrances: A case of students from the African Portuguese-speaking countries at two European Portuguese universities. *Journal of International Students*, *7*(2), 367–394. https://doi.org/10.32674/jis.v7i2.386

Bachl, M., & Mangold, F. (2017). Gesundheitsbezogene Informationsrepertoires: Ein nutzerorientierter Ansatz zur Analyse der Informationsnutzung im Gesundheitskontext. [Health-related information repertoires: A user-centred approach to the analysis of the use of information in the context of health]. In C. Lampert & M. Grimm (Eds.), *Gesundheitskommunikation als transdisziplinäres Forschungsfeld* (pp. 81–92). https://doi.org/10.5771/9783845285290

Bahl, R., Chang, S., McKay, D., & Buchanan, G. (2022). Health misinformation across multiple digital ecologies: Qualitative study of data from interviews with international students. *Journal of Medical Internet Research, 24*(7), Article e38523. https://doi.org/10.2196/38523

Balaj, M. (2022). Self-reported health and the social body. *Social Theory & Health, 20*, 71–89. https://doi.org/10.1057/s41285-020-00150-0

Baumann, E., Czerwinski, F., Rosset, M., Großmann, U., & Calhoun, K. (2020). Wie informieren sich Menschen mit Migrationshintergrund zum Thema Gesundheit? Teilergebnisse der Studie „HINTS Germany" zum Gesundheitsinformationsverhalten in Deutschland [How do people with a migrant background inform themselves about health? partial results of the study "HINTS Germany" on health information behaviour in Germany]. *Der Monitor für aktuelles Gesundheitswissen, 3*, 1151–1160. https://doi.org/10.1007/s00103-020-03192-x

Berens, E.-M., Ganahl, K., Vogt, D., & Schaeffer, D. (2021). Health literacy in the domain of healthcare among older migrants in Germany (North Rhine-Westphalia). Findings from a cross-sectional survey. *International Journal of Migration, Health and Social Care*, 17(1), 62–74. https://doi.org/10.1108/IJMHSC-09-2019-0078

Berry, J. W. (2022). Family and youth development: Some concepts and findings linked to the ecocultural and acculturation models. *Societies, 12*(6), Article 181. https://doi.org/10.3390/soc12060181

Bianchi, F. P., & Tafuri, S. (2022). Vaccination of elderly people affected by chronic diseases: A challenge for public health. *Vaccines, 10*(5), Article 641. https://doi.org/10.3390/vaccines10050641

Braun, P., Schwientek, A. K., Angerer, P., Guthardt, L., Icks, A., Loerbroks, A., & Apolinário-Hagen, J. (2023). Investigating information needs and preferences regarding digital mental health services among medical and psychology students in Germany: A qualitative study. *Digital Health, 9*. https://doi.org/10.1177/20552076231173568

British National Corpus (2018). British National Corpus 2014: A new resource for research and teaching on the contemporary English language. http://corpora.lancs.ac.uk/bnc2014/documentation.php

Carruthers, E., & Oakeshott, P. (2019). Refugee and asylum seeker usage of primary care: Medical student survey at two inner-city general practices. *Education for Primary Care, 30*(4), 248–250. https://doi.org/10.1080/14739879.2019.1613676

Carter, M., Pagliano, P., Francis, A., & Thorne, M. (2017). Australian university students and mental health: Viewpoints from the literature. *International Journal of Innovation, Creativity and Change*, *3*(3), 1–25.

Chae, S., Lee, Y.-J., & Han, H.-R. (2021). Sources of health information, technology access, and use among non–English-speaking immigrant women: Descriptive correlational study. *Journal of Medical Internet Research, 23*(10), Article e29155. https://doi.org/10.2196/29155

Chen, W., Lee K.-H., Straubhaar, J. D., & Spence, J. (2014). Getting a second opinion: Social capital, digital inequalities, and health information repertoires. *Journal of the Association for Information Science and Technology, 65*(12), 2552–2563. https://doi.org/10.1002/asi

Christancho, S., Peters, K., & Garces, M. (2014). Health information preferences among Hispanic/Latino immigrants in the U.S. Rural Midwest. *Global Health Promotion, 21*(1), 40–49. https://doi.org/10.1177/1757975913510727

Clark, J. (2005). Constructing expertise: Inequality and the consequences of information-seeking by breast cancer patients. *Illness, Crisis & Loss, 13*(2), 169–185. https://doi.org/10.1177/105413730501300207

Cool, C., & Belkin, N. J. (2011). Interactive information retrieval: History and background. In I. Ruthven & D. Kelly (Eds.), *Interactive information seeking, behaviour and retrieval* (pp. 1–14). https://doi.org/10.29085/9781856049740

Council of Europe (2024). The CEFR levels. https://www.coe.int/en/web/common-european-framework-reference-languages/level-descriptions

DAAD (2024). DAAD-Schnellabfrage Wintersemester 2024/2025. Zahl internationaler Studierender in Deutschland steigt erwartbar auf über 400.000 [DAAD Quick Survey. Number of international students in Germany expected to rise to over 400,000]. https://static.daad.de/media/daad_de/der-daad/kommunikation-publikationen/presse/auswertung_daad-schnellumfrage_wintersemester_2024_25.pdf

Derose, K. P., & Varda, D. M. (2009). Social capital and health care access: A systematic review. *Medical Care Research and Review, 66*(3), 272–306. https://doi.org/10.1177/1077558708330428

Destatis (2022, October 12). One Third of international students stay in Germany for a longer period. https://www.destatis.de/DE/Presse/Pressemitteilungen/2022/10/PD22_435_12.html

Elhami, A. (2020). Acculturation strategies: The study of bi-dimensional and uni-dimensional of Filipino immigrants in Madrid. *International Journal of Social Science Research, 8*(2), 1–15. https://doi.org/10.5296/ijssr.v8i2.16428

Ellis, D., Wilson, T. D., Ford, N., Foster, A., Lam, H. M., Burton, R., & Spink, A. (2002). Information seeking and mediated searching. Part 5. User–intermediary interaction. *Journal of the American Society for Information Science and Technology*, *53*(11), 883–893. https://doi.org/10.1002/asi.10133

Emtell Iwarsson, K., Larsson, E. C., Gemzell-Danielsson, K., Essén, B., & Klingberg-Allvin, M. (2019). Contraceptive use among migrant, second-generation migrant and non-migrant women seeking abortion care: A descriptive cross-sectional study conducted in Sweden. *BMJ Sexual and Reproductive Health, 45*(2), 118–126. https://doi.org/10.1136/bmjsrh-2018-200171

European Social Survey (2020). ESS Round 10 [Data set]. https://ess.sikt.no/en/data-builder/?tab=variables&rounds=0&%20seriesVersion=850&variables=3.1_86

Eurostat (2010, January 15). EHIS wave 1 guidelines. https://ec.europa.eu/eurostat/documents/203647/203710/EHIS_wave_1_guidelines.pdf/ffbeb62c-8f64-4151-938c-9ef171d148e0

Fabiano, G., Marcellusi, A., & Favato, G. (2020). Channels and Processes of Knowledge Transfer: How Does Knowledge Move Between University and Industry? *Science and Public Policy, 47*(2), 256–270. https://doi.org/10.1093/scipol/scaa002

Fisse, T., Link, E., Schrimpff, C., Baumann, E., & Klimmt, C. (2023). Health information repertoires of implant patients: Toward a deeper understanding of multiple source use and the role of health-related motives. *Health Communication, 39*(12), 2443–2457. https://doi.org/10.1080/10410236.2023.2258597

Forbes-Mewett, H., & Sawyer, A.-M. (2016). International students and mental health. *Journal of International Students, 6*(3), 661–677. https://doi.org/10.32674/jis.v6i3.348

Gautam, C., Lowery, C., Mays, C., & Durant, D. (2016). Challenges for global learners: A qualitative study of the concerns and difficulties of international students. *Journal of International Students*, *6*(2), 501–526. https://doi.org/10.32674/jis.v6i2.368

Gewalt, S. C., Berger, S., Ziegler, S., Szecsenyi, J., & Bozorgmehr, K. (2018). Psychosocial health of asylum-seeking women living in state-provided accommodation in Germany during pregnancy and early motherhood: A case study exploring the role of social determinants of health. *PloS One, 13*(12), Article e0208007. https://doi.org/10.1371/journal.pone.0208007

Ghaddar, S. F., Valerio, M. A., Garcia, C. M., & Hansen, L. (2012). Adolescent health literacy: The importance of credible sources for online health information. *Journal of School Health, 82*(1), 28–36. https://doi.org/10.1111/j.1746-1561.2011.00664.x

Goodman, L. F., Jensen, G. W., Galante, J. M., Farmer, D. L., & Taché, S. (2018). A cross-sectional investigation of the health needs of asylum seekers in a refugee clinic in Germany. *BMC Family Practice, 19*(1), Article 64. https://doi.org/10.1186/s12875-018-0758-x

Halder, S., Roy, A., & Cakraborty, P. K. (2010). The influence of personality traits on information seeking behaviour of students. *Malaysian Journal of Library & Information Science, 15*(1), 41–53.

Hasebrink, U., & Popp, J. (2006). Media repertoires as a result of selective media use. A conceptual approach to the analysis of patterns of exposure. *Communications, 31*(3), 369–387. https://doi.org/10.1515/COMMUN.2006.023

Hepp, A., & Hasebrink, U. (2014). Human interaction and communicative figurations: The transformation of mediatized cultures and societies. In K. Lundby (Ed.), *Mediatization of communication* (pp. 249–272). De Gruyter. https://doi.org/10.1515/9783110272215.249

Hepp, A., & Hasebrink, U. (2017). Kommunikative Figurationen: Ein konzeptioneller Rahmen zur Erforschung kommunikativer Konstruktionsprozesse in Zeiten tiefgreifender Mediatisierung [Communicative figurations. A conceptual framework for researching communicative construction processes in times of profound mediatisation]. *Medien & Kommunikationswissenschaft, 65*(2), 330–347. https://doi.org/10.5771/1615-634X-2017-2-330

Hill, D., Conner, M., Clancy, F., Moss, R., Wilding, S., Bristow, M., & O'Connor, D. B. (2021). Stress and eating behaviours in healthy adults: A systematic review and meta-analysis. *Health Psychology Review*, *16*(2), 280–304. https://doi.org/10.1080/17437199.2021.1923406

Islam, N. S., Patel, S., Wyatt, L. C., Sim, S.-C., Mukherjee-Ratnam, R., Chun, R., Desai, B., Tandon, S. D., Trinh-Shevrin, C., Pollack, H., & Kwon, S. C. (2016). Sources of health information among select Asian American immigrant groups in New York City. *Health Communication, 31*(2), 207–216. https://doi.org/10.1080/10410236.2014.944332

Jia, X., Pang, Y., & Liu, L. S. (2021). Online health information seeking behaviour: A systematic review. *Healthcare, 9*(12), Article 1740. https://doi.org/10.3390/healthcare9121740

Karnowski, V., Knop-Huelss, K., & Olbermann, Z. (2024). Mobile news access, mobile news repertoires, and users' tendency to talk about the news –An experience sampling study on mobile news consumption. *Online Media and Global Communication, 3*(2), 213–234. https://doi.org/10.1515/omgc-2023-0051

Kearney, L. K., Draper, M., & Baron, A. (2005). Counseling utilization by ethnic minority college students. *Cultural Diversity and Ethnic Minority Psychology, 11*(3), 272–285. https://doi.org/10.1037/1099-9809.11.3.272

Khoshlessan, R, & Das, K. P. (2017). Analyzing international students' study anxiety in higher education. *Journal of International Students, 7*(2), 311–328. https://doi.org/10.32674/jis.v7i2.383

Kleinert, E., Müller, F., Furaijat, G., Hillermann, N., Jablonka, A., Happle, C., & Simmenroth, A. (2019). Does refugee status matter? Medical needs of newly arrived asylum seekers and resettlement refugees - A retrospective observational study of diagnoses in a primary care setting. *Conflict and Health, 13*(1), Article 39. https://doi.org/10.1186/s13031-019-0223-z

Konttinen, H., Männistö, S., Sarlio-Lähteenkorva, S., Silventoinen, K., & Haukkala, A. (2010). Emotional eating, depressive symptoms and self-reported food consumption. A population-based study. *Appetite*, *54*(3), 473–479. https://doi.org/10.1016/j.appet.2010.01.014

Lambert, S. D., & Loiselle, C. G. (2007). Health information seeking behaviour. *Qualitative Health Research, 17*(8), 1006–1019. https://doi.org/10.1177/1049732307305199

Lazarsfeld, P. F., & Henry, N. W. (1968). Latent structure analysis. Houghton Mifflin.

Lee, C., Choi, Y., Kim, K., Lim, Y., Im, H., & Hong, S. J. (2023). Health-promoting behaviour among undergraduate students in the COVID-19 Era: Its association with problematic use of social media, social isolation, and online health information-seeking behaviour. *Archives of Psychiatric Nursing, 45*, 1–6. https://doi.org/10.1016/j.apnu.2023.04.022

Lönnqvist, J.-E., Leikas, S., Mähönen, T. A., & Jasinskaja-Lahti, I. (2015). The mixed blessings of migration: Life satisfaction and self-esteem over the course of migration. *European Journal of Social Psychology*, *45*(4), 496–514. https://doi.org/10.1002/ejsp.2105

Lukočienė, O., Varriale, R., & Vermunt, J. K. (2010). The simultaneous decision(s) about the number of lower- and higher-level classes in multilevel latent class analysis. *Sociological Methodology*, *40*(1), 247–283. https://doi.org/10.1111/j.1467-9531.2010. 01231.x

Marchionini, G. (1995). *Information seeking in electronic environments*. Cambridge University Press. https://doi.org/10.1017/CBO9780511626388

Martin, S., & Dyer, J. M. (2017). Health maintenance practices and healthcare experiences among international university students. *Journal of the American Association of Nurse Practitioners, 29*(11), 651–657. https://doi.org/10.1002/2327-6924.12524

Masai, A. N., Güçiz-Doğan, B., Ouma, P. N., Nyadera, I. N., & Ruto, V. K. (2021). Healthcare services utilization among international students in Ankara, Turkey: A Cross-sectional study. *BMC Health Services Research, 21*, Article 311. https://doi.org/10.1186/s12913-021-06301-x

Mediendienst Integration (2025). Hochschule [University]. https://mediendienst-integration.de/en/integration/hochschule.html

Misra, T., Connolly, A. M., Klynman, N., & Majeed, A. (2006). Addressing mental health needs of asylum seekers and refugees in a London borough: Developing a service model. *Primary Health Care Research and Development, 7*(3), 249–256. https://doi.org/10.1191/1463423606pc294oa

Möhring, W., & Schlütz, D. (2010). *Die Befragung in der Medien- und Kommunikationswissenschaft* [*Questioning in media and communication studies*]. Springer.

Nauck, B. (2008). Acculturation. In F. J. R. van de Vijver, D. A. van Hemert, & Y. H. Poortinga (Eds.), *Multilevel analysis of individuals and cultures* (pp. 379–409). L. Erlbaum. https://doi.org/10.4324/9780203888032

Newton, D. C., Tomyn, A., & LaMontagne, A. (2021). Exploring the challenges and opportunities for improving the health and wellbeing of international students: Perspectives of professional staff at an Australian university. *Journal of the Australian and New Zealand Student Services Association, 29*(1), 74–92. https://doi.org/10.30688/janzssa.2021.1.01

Nölke, L., Mensing, M., Krämer, A., & Hornberg, C. (2015). Sociodemographic and health-(care-)related characteristics of online health information seekers: A cross-sectional German study. *BMC Public Health, 15*, Article 31. https://doi.org/10.1186/s12889-015-1423-0

Ozer, S. (2013). Theories and methodologies in acculturation psychology: The emergence of a scientific revolution? *Psychological Studies, 58*(3), 339–348. https://doi.org/10.1007/s12646-013-0203-0

Powe, B. W. (2015). Health information seeking among rural African Americans, Caucasians, and Hispanics: It is built, did they come? *Nursing Clinics, 50*(3), 531–43. https://doi.org/10.1016/j.cnur.2015.05.007

Reilly, A. (2013). Protecting vulnerable migrant workers: The case of international students. *Australian Journal of Labour Law, 25,* 181–208.

Reinhardt, A., Brill, J., & Rossmann, C. (2021). Eine Typologie des Informationsverhaltens der Deutschen in der Corona-Pandemie unter Berücksichtigung von Themenverdrossenheit [A typology of the information behaviour of Germans in the

Corona pandemic, taking into account issue fatigue]. In F. Sukalla & C. Voigt (Eds.), *Risiken und Potenziale in der Gesundheitskommunikation. Beiträge zur Jahrestagung der DGPuK-Fachgruppe Gesundheitskommunikation 2020* (pp. 31–42). https://doi.org/10.21241/ssoar.74688

Rosenthal, D., Russell, J., & Thomson, G. (2008). The health and wellbeing of international students at an Australian university. *Higher Education, 55*(1), 51–67. https://doi.org/10.1007/s10734-006-9037-1

Russell, J., Rosenthal, D., & Thomson, G. (2009). The international student experience: Three styles of adaptation. *Higher Education, 60*, 235–249. https://doi.org/10.1007/s10734-009-9297-7

Russell, J., Thomson, G., & Rosenthal, D. (2008). International student use of university health and counselling services. *High Education, 56*(2), 59–75. https://doi.org/10.1007/s10734-007-9089-x

Sanci, L., Williams, I., Russell, M., Chondros, P., Duncan, A.-M., Tarzia, L., Peter, D., Lim, M. S. Y., Tomyn, A., & Minas, H. (2022). Towards a health promoting university: Descriptive findings on health, wellbeing and academic performance amongst university students in Australia. *BMC Public Health, 22*(1), Article 2430. https://doi.org/10.1186/s12889-022-14690-9

Schäfer, M., Stark, B., Werner, A. M., Tibubos, A. N., Reichel, J. L., Pfirrmann, D., Edelmann, D., Heller, S., Mülder, L. M., Rigotti, T., Letzel, S., & Dietz, P. (2021). Health information seeking among university students before and during the Corona crisis - findings from Germany. *Frontiers in Public Health*, *8*, Article 616603. https://doi.org/10.3389/fpubh.2020.616603

Scherer, H., & Naab, T. K. (2013). Messen im Zeitverlauf [Measurement over time]. In W. Möhring & D. Schlütz (Eds.), *Handbuch standardisierte Erhebungsmethoden in der Kommunikationswissenschaft* (pp. 103–123). Springer VS. https://doi.org/10.1007/978-3-531-18776-1_6

Schmidt, H., Wild, E. M., & Schreyögg, J. (2021). Explaining variation in health information seeking behaviour – Insights from a multilingual survey. *Health Policy*, *125*(5), 618–626. https://doi.org/10.1016/j.healthpol.2021.01.008

Schuch, F. B., Stubbs, B., Meyer, J., Heissel, A., Zech, P., Vancampfort, D., Rosenbaum, S., Deenik, J., Firth, J., Ward, P. B., Carvalho, A. F., & Hiles, S. A. (2019). Physical activity protects from incident anxiety: A meta-analysis of prospective cohort studies. *Depression and Anxiety*, *36*(9), 846–858. https://doi.org/10.1002/da.22915

Shaw, R. J., & Johnson, C. M. (2011). Health information seeking and social media use on the internet among people with diabetes. *Online Journal of Public Health Informatics, 3*(1), Article e61000. https://doi.org/10.5210/ojphi.v3i1.3561

Sherry, M., Thomas, P., & Chiu, W. H. (2010). International students: A vulnerable student population. *Higher Education, 60*(1), 33–46. https://doi.org/10.1007/s10734-009-9284-z

Skarpa, P. E., & Garoufallou, E. (2021). Information seeking behaviour and Covid-19 pandemic: A snapshot of young, middle aged and senior individuals in Greece. *International Journal of Medical Informatics, 150*, Article 104465. https://doi.org/10.1016/j.ijmedinf.2021.104465

Skromanis, S., Cooling, N., Rodgers, B., Purton, T., Fan, F., Bridgman, H., Harris, K., Presser, J., & Mond, J. (2018). Health and well-being of international university students, and comparison with domestic students, in Tasmania, Australia. *International Journal of Environmental Research and Public Health, 15*(6), Article 1147.

https://doi.org/10.3390/ijerph15061147

Smith, R. A., & Khawaja, N. G. (2011). A review of the acculturation experiences of international students. *International Journal of Intercultural Relations, 35*(6), 699–713. https://doi.org/10.1016/j.ijintrel.2011.08.004

Ströhle A. (2009). Physical activity, exercise, depression and anxiety disorders. *Journal of Neural Transmission*, *116*(6), 777–784. https://doi.org/10.1007/s00702-008-0092-x

Tung, W. C., Lin, Y., Chao, H. W., & Chen, Y. (2022). HPV vaccination, information sources, and acculturation among Chinese college students aged 18-26 in the United States. *Research in Nursing & Health*, *45*(2), 194–204. https://doi.org/10.1002/nur.22185

Udah, H. (2021). Coloniality of power and international students experience: What are the ethical responsibilities of social work and human service educators? *Ethics and Social Welfare*, *15*(1), 84–99. https://doi.org/10.1080/17496535.2021.1880612

Udah, H., & Francis, A. (2022). Vulnerability and well-being: international students' experience in North Queensland, Australia. *Journal of Comparative & International Higher Education, 14*(5), 171–196. https://doi.org/10.32674/jcihe.v14i5.3942

Van Agteren, J., Woodyatt, L., Iasiello, M., Rayner, J., & Kyrios, M. (2019). Make it measurable: Assessing psychological distress, wellbeing and resilience at scale in higher education. *Student Success*, *10*(3), 1–13. https://doi.org/10.5204/ssj.v10i3.1411

Verčič, A. T., & Špoljarić, A. (2020). Managing internal communication: How the choice of channels affects internal communication satisfaction. *Public Relations Review, 46*(3), Article 101926. https://doi.org/10.1016/j.pubrev.2020.101926

Vermunt, J. K. (2008). Latent class and finite mixture models for multilevel data sets. *Statistical Methods in Medical Research*, *17*(1), 33–51. https://doi.org/10.1177/0962280207081238

Vermunt, J. K., & Magidson, J. (2020). How to perform three-step latent class analysis in the presence of measurement non-invariance or differential item functioning. *Structural Equation Modeling: A Multidisciplinary Journal, 28*(3), 356–364. https://doi.org/10.1080/10705511.2020.1818084

Waldman, L., Ahmed, T., Scott, N., Akter, S., Standing, H., & Rasheed, S. (2018). 'We have the internet in our hands': Bangladeshi college students' use of ICTs for health information. *Global Health, 14*, Article 31. https://doi.org/10.1186/s12992-018-0349-6

Wang, W., & Yu, N. (2015). Coping with a new health culture: Acculturation and online health information seeking among Chinese immigrants in the United States. *Journal of Immigrant and Minority Health, 17(*5), 1427–1435. https://doi.org/10.1007/s10903-014-0106-8

Waters, E., Wheeler, C., & Hamilton, J. G. (2016). How are information seeking, scanning, and processing related to beliefs about the roles of genetics and behaviour in cancer causation? *Journal of Health Communication, 21*(2), 6–15. https://doi.org/10.1080/10810730.2016.1193917

Wong, N. C. (2012). Interaction of comparative cancer risk and cancer efficacy perceptions on cancer-related information seeking and scanning behaviours. *Communication Research Reports, 29*(3), 193–203. https://doi.org/10.1080/08824096.2012.684808

Wurdak, M., Dörfler, T., Eberhard, M., & Wolstein, J. (2010). Tagebuchstudie zu Trinkmotiven, Affektivität und Alkoholkonsum bei Jugendlichen [Diary-based study concerning drinking motives, affectivity, and alcohol consumption among adolescents]. *SUCHT, 56*(3-4), 175–182. https://doi.org/10.1024/0939-5911/a000027

Yilmaz, N. G., Sungur, H., Van Weert, J. C. M., Van den Muijsenbergh, M. E. T. C., &

Schouten, B. C. (2022). Enhancing patient participation of older migrant cancer patients: Needs, barriers, and eHealth. *Ethnicity & Health, 27*(5), 1123–1146. https://doi.org/10.1080/13557858.2020.1857338

Yoon, J. W., & Kim, S. (2014). Internet use by international graduate students in the USA seeking health information. *Aslib Journal of Information Management, 66*(2), 117–133. https://doi.org/10.1108/AJIM-01-2013-0005

Author Contributions

Conceptualisation (main idea, theory): Janine Brill, Veronika Karnowski, & Constanze Rossmann
Funding acquisition: Not applicable
Project administration: Janine Brill
Methodology (design, operationalisation): Janine Brill, Veronika Karnowski, & Constanze Rossmann
Data collection: Janine Brill
Data analysis: Janine Brill
Writing—original draft: Janine Brill
Writing—review & editing: Janine Brill, Veronika Karnowski, & Constanze Rossmann

Author Biographies

Janine Brill is a Research Associate at the Chemnitz University of Technology, Germany. Her research focuses on health communication, particularly health information-seeking behaviour and digital health, migration research, and journalism studies.

Veronika Karnowski is a Professor of Media and Communication at Chemnitz University of Technology, Germany. Her research focuses on mobile media, social media and news, as well as eHealth and mHealth.

Constanze Rossmann holds a chair of communication at LMU Munich. She used to be Professor of Communication, vice dean for empirical research and vice director of the Erfurt Laboratory for Empirical Research at the University of Erfurt until 2021, where she co-founded the Master's Program Health Communication. She is also a co-founder and former speaker of the Health Communication Division within the German Communication Association. Her research interests include health and crisis communication with a focus on health-related media use and effects, health campaigns, and mobile Health.

Appendix A - Code System for Open-Ended Responses on Sought Health Information

Code number	Code	Code description	Anchor example
1	(Treatment of) Symptoms	This category is coded when participants indicate they have searched for information regarding acute illnesses, corresponding physical symptoms and their treatment. It is not coded if the search specifically concerns medication information. In such cases, Code number 3 is applied.	„Home remedies to cure gas in stomach“
2	General information about illnesses	This category is coded when participants have searched for general information on (chronic) illnesses. It does not need to be evident whether the participants or individuals in their social environment are affected or whether the search is based on personal interest.	„Rheumathoid Arthritis“
3	Medication	This category is coded when participants have searched for information on the availability, ingredients, applications, effects of medications, or pharmaceutical treatments.	„I asked about which medicines to take for my stomach”
4	COVID-19	This category is coded when participants have searched for information related to the coronavirus, including regulations in Germany, vaccination, symptoms, or treatments.	„Covid vaccine“
5	Medical treatments	This category is coded when participants have searched for information on the costs, process, or effects of medical treatments and procedures or surgical interventions.	„Post abdominal surgery, its effect”
6	Mental health	This category is coded when participants have searched for information on mental health issues, stress, or anxiety, or when they indicate having visited a therapist or an equivalent mental health service.	„Therapy session with a licensed psychologist”
7	Gynaecology and sexual health	This category is coded when participants have searched for information on sexual health topics such as women's health, contraceptives, gynaecological conditions like Endometriosis, sexually transmitted diseases, menstruation, urology, or pregnancy. It is also coded when participants indicated having visited a gynaecologist, urologist, or an equivalent health service.	„Effect of contraceptive pills on fertility”

Appendix A. Code System for Open-Ended Responses on Sought Health Information (continued)

Code number	Code	Code description	Anchor example
8	Fitness, physical activity and measurement	This category is coded when participants have searched for fitness information, such as training methods, or body metrics like steps taken, heart rate, or blood sugar levels.	„Heart rate during bicycle ride"
9	Diet and nutrition	This category is coded when participants have searched for information on dietary habits, food ingredients, calorie values, recipes, diets, or specific nutritional guidelines.	„I looked up calories for a few recipes on My Fitness Pal"
10	Scheduling a medical appointment	This category is coded when participants have searched for information to schedule appointments with health professionals. It specifically concerns information related to appointment booking, not the search for medical practices or hospitals in the area. The latter is coded under Code 11.	„Check for doctor's appointments“
11	Search for nearby health services	This category is coded when participants have searched for information on the availability of local medical practices, hospitals, pharmacies or other health services. If the search concerns scheduling appointments with such health services, Code 10 is applied.	„Checked if there is a skin doctor in [anonymised]."
12	Health insurance	This category is coded when participants have searched for information related to health insurance, such as signing up for or cancelling a policy, its costs, or the terms and conditions of the insurance.	„I searched for how to cancel a health insurance plan"