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“I heard about some pills” -the online as a sharing space and source of information about performance consumption among students

Abstract

Departing from a broader sociological study, this article presents exploratory research seeking to analyse practices of online information exchange on the consumption of medicines and food supplements among students, mainly to improve cognitive performance. It aims to show that the Internet is a relevant space which should be considered when analysing where lay people, specifically students, get information about medicines. The empirical field was limited to online open discussion forums, websites, and blogs registered in Portugal, and the collected information was subjected to a qualitative content analysis. The research took place between January 2021 and February 2022, and the analysed threads date back to March 2015. The results show that young people use these platforms to ask questions related to the consumption of medicines and supplements for cognitive performance. While sharing experiences is central to the validation of practices and behaviours, key elements in this discussion also include the construction of a shared social identity, the possibility of anonymity, and the attribution of credibility to the sources of information.

Keywords

Online forums, health information, medicine consumption, youth, cognitive enhancement.

1. Introduction

The main purpose of this study is to analyse the online information exchange practices about the consumption of medicines and food supplements among students, and their expectations regarding improvements in concentration and memorization skills in preparation for evaluations.

This study is part of a larger sociological research project¹. One aspect of analysis of this project focuses on the sources of information individuals turn to when seeking information

¹ The research was approved and funded by the Portuguese Foundation for Science and Technology (FCT): “Medicines and food supplements in performance consumption: social practices, contexts and literacy” (PTDC/SOC/30734/2017). Three institutions participate in this research: CIES/ISCTE – University Institute of Lisbon, in partnership with the Egas Moniz School of Health & Science (IUEM) and the Institute of Sociology – Faculty of Arts of the University of Porto.

about medicines and food supplements. A survey conducted in 1107 pharmacies revealed a substantial use of the Internet, blogs and discussion forums as a source of information, especially among younger people. More specifically, regarding information about medicines, 7.9% of the population younger than 30 years old (n=304) said they used blogs/discussion forums "Often" or "Always," and 36.9% used an Internet search, compared to just 3.3% and 25.1% of respondents aged 40 years or older (n=542). Regarding the information about food supplements, 10.1% of the population under 30 years old reported using blogs/discussion forums "Often" or "Always," and 33.2% used an Internet search, compared to 3.3% and 17.2% of respondents aged 40 years or more.

In view of these results, we established that the online world should be considered in the analysis of sources of information about medicines, as a means of transmission of knowledge and practices among lay people, with its own potential and limitations. Moving beyond the notion of the Internet as a main source of obtaining health-related information, a topic that has already been widely studied, our exploratory approach considers specifically the use of forums and blogs.

Since it has been established that young people are heavy Internet users (Escoffery *et al.*, 2005; Gray *et al.*, 2005; Banas, 2008; Fergie, Hunt & Hilton, 2013; Lupton, 2020), and that their consumption of medicines and food supplements is an important phenomenon (Vrecko, 2015; Lopes *et al.*, 2015; Cavaco, Ribeiro & Norgaard, 2022), we analyse the interaction between these two themes. Although this is not a new topic, its relevance and timeliness deserve a deeper analysis, which we aim to conduct.

We begin by framing the theme theoretically, looking at the Internet as a source of health-related information, then we focus on open online forums as spaces for sharing information about health and the consumption of medicines and supplements and, finally, we take a closer look at the presence of young people in these online spaces, having the Portuguese reality as reference. The empirical field was limited to open online discussion forums, websites, and blogs registered in Portugal, and the collected information was subjected to a qualitative content analysis. The results of this exploratory study show that young people use online media such as blogs and discussion forums to ask health-related questions, in particular, about the consumption of medicines and natural supplements for cognitive performance.

2. The online as a space for information sharing: theoretical considerations

2.1. *The Internet as a source of information about health and consumption of medicines and natural supplements*

The Internet has become an important source of information on a variety of health issues. Twenty years after the beginning of its widespread use, several authors have studied this phenomenon focusing, for example, on the reasons why people use the Internet as a source of information as an alternative (or complement) to other sources like doctors and other specialists. People use the Internet and social media to acquire knowledge, possibly combining it with lay and expert knowledge, to become "evidence-based activists" (Rabeharisoa, Moreira & Akrich, 2014). They not only are interested in "facts," but also seek comfort, guidance and social support (Doyle, 2013; Samerski, 2019). Another benefit is that they can exchange ideas and ask questions quickly and anonymously (Dresen *et al.*, 2014). The Internet has thus become a prime place to quickly find information about a particular doctor, a specific health condition, experimental or alternative treatments, or to bring up sensitive topics that are difficult to discuss (Banas, 2008). As a result, the Internet empowers individuals to take an active role in their own care (Cotten, 2001). In addition, the Internet has revolutionised the way patients obtain medical information by enabling the democratisation of access to biomedical knowledge and becoming a significant source of health information

for lay people (Nettleton, Burrows & O'Malley, 2005; Escoffery *et al.*, 2005; Fage-Butler & Jensen, 2013). Miah and Rich (2008) use the concept of "medicalisation of cyberspace" to refer to the almost unlimited access to all kinds of medical and health information and the emergence of many medical services on the Internet.

Despite the above benefits from using the Internet for researching health-related information, the literature has also revealed some negative aspects. Examples include concerns about the quality of the available information, the ability of lay individuals to understand this information, and the emergence of *cyberchondria* –hypochondria derived from unbalanced and unqualified reading of biomedical information (Fage-Butler & Jensen, 2013). Although the Internet offers an inexhaustible source of health advice to those who search for it, no governmental or professional authority is responsible for evaluating and regulating this information. Individuals that seek information online are on their own, with a high risk of exposure to unreliable information or erroneous self-diagnosis, as well as to potential misunderstandings about medical and health applications (Miah & Rich, 2008; Banas, 2008; Kimmerle, Gerbing & Thiel, 2012).

The Internet is an inherently interactive environment that transcends national boundaries, rules, and distinctions between professions and knowledge. It is the users of online information, not the authors or professional experts, who decide which material is accessed and how it is used. Thus, the Internet becomes a new space in the struggle for health expertise that will transform the relationship between health professionals and their clients (Hardey, 1999).

2.2. Online forums as spaces to share information about health and consumption of medicines or supplement

Besides being a platform where people search for information in general, the Internet offers health information and services in many formats, including text, emails, chats, and server lists. Furthermore, it allows sharing personal experiences via online forums and blogs.

Several studies seek to understand the reasons why people use these platforms for health information. These include fulfilling the needs for sharing personal experiences and for belonging to a community, built around either common problems, diseases, or questions (Fage-Butler & Jensen, 2013; Tighe *et al.*, 2017). Websites and online forums should be analysed as a form of social support, often resembling more traditional face-to-face support groups. What is most sought after is knowledge distilled from experience and support from other individuals in the search for a shared social identity (Doyle, 2013). In virtual communities, tribalisation is easier to achieve than in real life, as people tend to find like-minded individuals and groups while avoiding opinions and information contrary to their own (Rusu, 2016). Other key aspects are the possibility of anonymity, that is, the ability to communicate without fear or worry, and the ability to choose what information and to what degree to share it (Fage-Butler & Jensen, 2013). This feature is particularly useful if it involves stigmatising behaviours, illicit substance use, or those associated with a health risk (Fage-Butler & Jensen, 2013; Dresen *et al.*, 2014; Tighe *et al.*, 2017).

The negative aspects associated with these practices have also been identified and discussed. One of the most pertinent is concern with the lack of credible information. The lack of control over information is particularly relevant in discussion forums, where people have conversations about specific topics in the form of messages. There are virtually no rules for quality control in these platforms (Kimmerle, Gerbing & Thiel, 2012). Sources of information are not cited or are unknown, and any scientific framing of the information is rarely discussed (Miah & Rich, 2008). One source of uncertainty is the amount of information available online, which is often contradictory (Rusu, 2016). When approaching an online community to ask for health advice, one should expect to receive different, sometimes contradictory, opinions. The decision to act on the information depends on the credibility

attributed to its source. Thus, it is important to understand how credibility is constructed. First, analysis of discussions suggests that people tend to believe those who share their point of view (Rusu, 2016). This is particularly the case when the need for reassurance is the primary reason for seeking help online. Another source of credibility is shared history; community members tend to believe in people with whom they already interacted online in a positive way, even if those interactions were about other topics. There is also the instituted credibility of "experts" and group administrators, sometimes emerging as more credible than doctors or other health professionals (Rusu, 2016). Community members employ different strategies to increase their own credibility. For example, they may cite written sources, online or otherwise, or opinions they have heard from physicians, in order to leverage the credibility attributed to experts. Aspects that seem to undermine credibility are grammatical errors, using fake names, being a "newbie" in the forum, or not having a real profile picture. These aspects are pointed out when the person expresses an opinion in disagreement with the general belief, but tend to be ignored if the opinion is along the same lines as the group (Rusu, 2016).

Another concern is the possibility that the information found in websites and discussion groups, especially those specialised in diseases, may promote self-medication. Many times, information such as how to use (posology) is available, allowing an individual to start a treatment without consulting with a doctor or without the diagnosis of a specialist (Bessel *et al.*, 2003; Souza, Marinho & Guilam, 2008). The availability of such information can cause several types of harm to users, including damage to health, adverse effects and the deterioration of the disease, false hopes or anxiety regarding the prognosis of the disease, as well as unnecessary purchase of medicines. Other times, information about drug risks and side effects are absent or understated on websites, leaving it up to the consumer to judge the quality and reliability of the information, which may be difficult for individuals without technical knowledge (Bessel *et al.*, 2003; Souza, Marinho & Guilam, 2008).

Some studies provide quite illustrative examples of these features. For instance, Dresen *et al.* (2014) analyse online forums as spaces for sharing experiences and information about performance enhancing medicines. The authors explore the use of physical performance enhancing products by athletes and bodybuilders, and find that online environments enable the construction of deviant behaviours. The Internet serves as a learning space, providing excellent opportunities for these users to acquire basic information about the drugs and to deepen their knowledge by anonymously exchanging ideas and asking questions. In another study (Fox, Ward & O'Rourke, 2005), the authors examine the use of weight loss medicines in Internet discussion forums, more specifically, how Xenical^{®2} users share information to become experts in their condition and how to manage it. Participants addressed a variety of topics about the drug, its effectiveness, side effects, their progress, and their encounters with the medical profession. The forum was characterised by high levels of support, encouragement, and advice for others on diet and for those new to using Xenical[®]. Drawing on an ethnographic Internet approach, Rusu (2016) addresses the question of how medical information is created and transferred in a virtual community of parents, how people choose their sources of information, and the consequences of their decisions. The author concludes that, in this community, users are motivated by the need to validate, among their peers, the recommendations given by health professionals, in order to strengthen confidence in their parenting decisions.

² International Non-Proprietary Name: Orlistat (authors' note).

2.3. Youths/students, Internet and information search about health and medicines

Within the users that visit discussion forums and blogs to access health information, we will focus on young people/students. The association between young people and the use of digital media is known to be strong. The concept of "digital natives" (Prenski, 2001), coined to characterise individuals born after the 80's, due to their contact since childhood with the devices and the language of computers, videos, video games, social media and the Internet, seems to be more and more current. This concept was also used by García García and Rosado-Millán (2012), who observed that the way teens and young adults use the Internet through the Open Digital Content Services is transforming social relationships, making them open, active, comprehensive, immediate, and scarcely controllable by other social agents. In Portugal, according to recent data from the National Institute of Statistics³, in 2020 the proportion of people aged between 16 and 24 who used the Internet in the 3 months prior to the interview was 99.5%, while in 2017 it was already 90.0%.

Several studies conducted in the USA and the UK using surveys, interviews or focus groups concluded that young people, defined as 11 to 19 years old and university students, despite their diversity, often use the Internet to search for information about health or medication use (Escoffery *et al.*, 2005; Gray *et al.*, 2005; Banas, 2008; Fergie, Hunt & Hilton, 2013). One explanation is that, as young adults, many college students are living on their own for the first time and find themselves responsible for their health and well-being (Banas, 2008). As avid and capable technology users, many of them will turn to the Internet as a source of health information. However, some caveats are also noted. Despite extensive use of the Internet, Banas (2008) notes that college students may not be adequate users of online health information literacy skills. According to Gray *et al.* (2005), despite being unlikely that it will take over the role of peers and trusted adults, the Internet has found an important place among adolescents' repertoire of health information sources.

When we analyse this topic within the context of young people, two aspects become more relevant. One is the need for anonymity, since young people, in matters of health as in many others, may have less autonomy to make decisions, and may also be more subject to feelings of shame, which can be dissuasive of seeking a doctor. Thus, the Internet is often used for sensitive and "embarrassing" health issues (Gray *et al.*, 2005; Fergie, Hunt & Hilton, 2013). Another aspect relates to the question of the credibility of the information found in these media, which has already been mentioned. Since these individuals may have less experience in discerning what is reliable or not, they may also face greater dangers (Escoffery *et al.*, 2005; Fergie, Hunt & Hilton, 2013). This is especially so if we refer to the reports of other users in forums, often rich in details and enthusiasm, which can arouse the curiosity of the participants (Souza, Marinho & Guilam, 2008).

Some health-related topics are more likely to be searched on the Internet than others. In Banas' (2008) study, a particular type of disease or condition (83%) and nutrition, exercise, or weight management topics (66.3%) were the most searched subjects. Mental health issues (26%), a particular doctor or hospital (26%), and a specific prescription drug (25%) were the next most searched. In Escoffery *et al.* (2005), 39.6% of respondents indicated "medicines and drugs" as one topic of research on the Internet. According to the Network Society in Portugal Survey (Cardoso *et al.*, 2015), 40.9% of respondents (n=852) read blogs, 45.6% searched for health information, and 54.3% made comments on blogs or on someone's mural.

It is worth mentioning the Internet search topics, since the search for information about medicines and supplements is inseparable from the current social dynamics associated with the pharmaceuticalization of society. This phenomenon, defined as "the transformation of human conditions into pharmaceutical matters of treatment or enhancement" (Williams *et al.*, 2008, p. 851), helps understanding the behaviours related to the consumption of performance-

³ www.ine.pt.

enhancing drugs. Regarding young people, Vrecko (2015) examines over-the-counter stimulant consumption among US university students to enhance academic performance. From a qualitative analysis focused on four sources of drug diversion (friends, family members, black market, and doctors under false pretences), the author concludes that this is a complex and heterogeneous phenomenon, subject to practical and ethical challenges.

In Portugal, a study among young people (aged 18–29 years), concluded from a survey (n=1483) that most respondents had already used drugs or natural products for performance enhancement (Lopes *et al.*, 2015). The consumption indicator, which includes all individuals who reported using at least one product for these purposes, showed that only 34.2% of the sample had never used anything. Although this consumption indicator does not inform about the regularity of consumption or the diversity of purposes, it shows that young people are quite familiar with them. Regarding cognitive/mental performance, the highest consumption is observed in drugs for concentration (25.3%) and drugs for relaxation (23.8%). Some of the reasons most frequently indicated for consumption were, among students, to improve study and concentration skills (26.9%) and for school exams and other assessments (23.7%); and, among young workers, to improve the response to the daily demands of work (11.5%) and to improve their body image and feel better (15.3%). In both groups, the willingness to consume natural products is higher than to consume pharmaceuticals (Lopes *et al.*, 2015).

Following the previous research, a very recent study by Cavaco, Ribeiro and Nørgaard (2022) concludes that one third of the participants (745 university students) had consumed products to increase cognitive performance. Although there is a consumption of psychoactive substances for cognitive performance, the data shows a prevalence of dietary supplements and natural products as cognitive enhancers. Another aspect highlighted is the statistical correlation between the area of study and consumption, with a greater representation among health-related university students. Having greater memorisation capacity, more clarity and more focus are among the main reasons for improving cognitive performance. The issue of addiction is a common concern.

3. Materials and Methods

3.1. Delimitation of the empirical field

In order to find online information sharing habits about the consumption of medicines and natural products among Portuguese youths, we limited the empirical field to open blogs and open online discussion forums of national origin, excluding social media (Facebook, Instagram, etc.), where all the information is public.

The search for information from websites brings great challenges, namely in the way the information is collected. A key aspect to consider when searching online is the difficulty of covering the enormous quantity of data available (Jose & Lee, 2007). In order to be as exhaustive as possible, the process of researching these sources began by entering the following keywords in two search engines: "forums about medicines;" "forums about supplements;" "opinions on medicines;" "opinions on supplements;" "blogs about medicines;" "blogs about supplements;" "health forum;" and "SAPO blogs"⁴. The resulting links were the subject of the first stage of screening, so that afterwards we could select the websites with relevant information to our research objectives. We did not intend to explore sites of pharmacies or companies related to this area, nor to find sources of information from experts (doctors, pharmacists...), but rather interactions between lay people.

As a result of this search, we did not find a specific forum/website dedicated to discussing the use of medications/supplements; but we found sites/forums/blogs dedicated to other topics, where people sometimes asked questions related to the use of medications/supplements. In this paper we will focus only on the topic of concentration and memory,

⁴ Portuguese Internet portal that aggregates several contents, namely, blogs.

applied to students, i.e., the consumption of medicines and/or natural supplements which, from the point of view of these individuals, can help them study and take tests and exams. On this subject, we found posts and comments in the Uniarea Forum (www.uniarea.com), a forum directed to the student community, and in two blogs hosted on the SAPO portal. The topics ranged from the most direct "Memory aids," "Supplements," "Use of supplements" and "Drugs for studying," to others of general scope such as one "Faculty of Health Sciences," where the questions were asked. Publication dates range from March 2015 to January 2021, and the online consultation initially ran from December 2020 to January 2021, being revised and completed in February 2022. Therefore, information gathering was retrospective in nature and consisted of selecting excerpts of online interactions that featured the topic of medicine or supplement use for performance enhancement. Our sample of participants is not amenable to sociographic characterisation due to the anonymity and pseudonymisation of users on these sites; however, users presented themselves as students.

The analysis of posts in chat rooms, blogs, and discussion forums has become a fertile source of information for social scientists with an interest in health or health-related issues (Bryman, 2008; Hookway & Snee, 2017). This (thematic) approach has been described as a combination of documental analysis and a form of observation where naturally occurring interactions between forum members can be witnessed without intervention, i.e., a form of observing real interactions in a non-intrusive way (Doyle, 2013).

This methodology, although less common than the usual quantitative analyses using surveys or qualitative analyses via interviews –an aspect that brings originality to our study–, was also chosen in several of the aforementioned works (Fox, Ward & O'Rourke, 2005; Souza, Marinho & Guilam, 2008; Kimmerle, Gerbing & Thiel, 2012; Doyle, 2013; Rusu, 2016; Fage-Butler & Jensen, 2013, 2016). Lupton (2020) identified four distinct aspects of digital sociology, and our study falls into two of them: sociological analysis of digital media use (studying institutions, structures, and social relations from digital media); and digital data analysis (collecting and processing data from digital media, either through qualitative or quantitative methodology).

3.2. Data Analysis Method

We used content analysis as a method of data analysis, applied to the content collected in online media. According to Bardin (2011), content analysis can be defined as a set of communication analysis techniques that aim to extract from messages, through systematic and objective procedures, indicators (quantitative or not) that allow the inference of knowledge about the conditions of production/reception of these messages. Hsieh and Shannon (2005) state that the objective of content analysis is to analyse the information in a systematic way, without neglecting all the contributions reported in an initial phase. In other words, firstly a categorisation of the information is carried out based on previously defined codes. In order not to neglect any contributions, as the process develops, the data not associated to any of the existing categories will be analysed *a posteriori*, ensuring the possibility of creating new codes if the volume of data justifies it.

Discourses can be analysed qualitatively according to their rhetoric (Sillince & Brown, 2009). Concerning the current topic, a particular type of rhetoric must be mentioned: a rhetoric of dualities, with a contrast of antagonistic positions. Even though the Internet is not a suitable medium to detect emotional features in the discourse, which can be a drawback for this type of analysis, it is possible to infer them through the use of emojis (symbols used to convey emotional states), capital letters in particular words or sentences of the argument, or even the insertion of the exclamation mark (Sullivan, 2003). However, in this paper we will focus solely on the thematic analysis of the information and not on the subtleties of the modes of communication.

The posts and respective comments found within the themes of interest for this research were then inserted in an analysis grid (whose structure is presented in Figure 1) and later analysed using the content analysis software MaxQda, resulting in the categorisation of 108 excerpts⁵.

Figure 1. Content analysis grid (dimensions of analysis).

Sharing of experiences (results obtained by themselves and others)
Description of symptoms
Therapeutic trajectory (consumptions, dosages, reactions...)
Request for help / clarification of doubts
Sharing of lay knowledge (learning acquired through experience or through what others do, etc.)
Diagnosis
Reference to effects of medications / supplements
Consumption recommendations (drugs, dosages, how to take them)
Recommendations for consultation with health care professionals / others
Other recommendations
Sharing of expertise (evoking medical or other scientific sources)
Description of diagnosis
Description of recommended therapeutics (medication, dosage, instructions for use)

4. Results

The collected information shows that, in general, interactions arise when a user decides to expose his/her personal case, usually related to the difficulty in concentrating, to a feeling of tiredness associated with studying or nervousness in moments of evaluation. The user seeks help from other users, either to clarify some doubt, or to express openness towards any suggestion that may arise from it. There is, therefore, a significant number of young people seeking validation from their peers.

4.1. *The dimension of sharing experiences*

Good evening! Lately I can't concentrate while studying, I was wondering if anyone has ever taken supplements for memory and concentration? And if so, do they help at all? Thanks! (User1_2017)

Good afternoon everyone! I am preparing for the national exams and I feel pretty confident with the subject. However, whenever I am solving exams from previous years I keep failing in small details due to lack of concentration. [...] Anyone who 'suffers' from the same and has tips on how to improve? Thank you so much!!! (User2_2020)

These elements are part of the dimension called experience sharing, on which a considerable part of the excerpts was classified (38 excerpts, or 35.2% of the total). Users who seek to be informed (or answers to their questions) show a variety of concerns. There are "moral" concerns, as if such consumption is illegal or wrong; there is fear about possible side effects, including addiction/dependence; and there are concerns about making a decision based on unreliable information, either because the source is unknown (situations in which "they heard" that such a drug can have the desired effect), or because the source is not an expert (for example, a relative). Digital media enable the "safe" expression of fears related to side effects and the search for a sense of security that can guide one's decision, stemming from a

⁵ For the purpose of illustrating the main results of our analysis, some translated citations will be presented without identifying their original source and further anonymizing the participants by replacing their usernames with numbers. The year of publication is displayed, but the day and month are omitted. Also, names of medicines' brands have been replaced by random letters.

hypothetical relief in knowing that others have already done the same without problems. This confirms that the possibility of expressing these doubts under the cover of anonymity is of great relevance.

I had a bit of a bad time with nervousness and the tests this period. [...] So, about two weeks ago, my aunt [...] brought me a box of "A" saying it helped with my shakes and cold sweats. The thought of taking that bothered me, so I didn't actually take it, but I keep the box of pills on my desk and I'm sure I'll use them in the next round of tests. At least try it once (User3_2015).

I have heard of some pills called "magnesium pills" and I would like to know if the use of these pills is legal and if it's considered doping or something like that!!!? I think you can buy them at a pharmacy easily... so I really don't know! (User4_2017).

I've been having many doubts if I should take these supplements or not because I feel trapped with exams and the amount of things I have to study. I was worried about the side effects, because I didn't know that these types of drugs make you gain weight! [...] And I know that this type of medication is nothing too serious, but this thing of becoming dependent on pills scares me a lot [...] (User5_2018).

These requests generated various types of responses and reactions. Still in the dimension of sharing experiences, one type of response is, precisely, the sharing of personal experiences of other participants in these forums/blogs, or of experiences they know of others, through the description of therapeutic trajectories (consumption, dosages, and reactions). In these therapeutic trajectories, participants seem to emphasize experiences whose effects did not coincide with those initially intended.

I was advised by a tutor to take "A" in 11th grade because at that time I had trouble sleeping. I took it for three days, at night, and I didn't like the effect. In fact, it calmed me down, and even made me sleepy (one of the reasons I stopped taking it), but in the end it only interfered with the physical consequences of being nervous, like shaking, sweating... The nervousness and worry itself were still there (and this was the other reason I stopped taking it) (User6_2015).

But yes, it's common in college to have people who take... mainly benzos, like "B" or else beta blockers like "C." Especially before exams, presentations (User7_2016).

I took "D" once because of the muscle relaxant effect. It affected me so much that I was thinking slower than a snail and must have slept for about 20 hours (I was also sleep deprived for a few days because of the pain...). I can't imagine taking that during an exam... I think I'd hit my head on the table (User8_2016).

There is also a clear duality in the responses, in favour or against these consumptions. This type of duality seems to fit within the rhetoric mentioned by Sillince and Brown (2009). A minority of users tries to help by sharing their example or providing educational advice. Most of the participants, on the other hand, make value judgments and criticise off label or unprescribed drug use.

The national exams are approaching, and with it come the advice from tutors and teachers and even doctors that we should take certain medicines to help with nervousness and increase our school performance, which I totally disagree with. [...] If they already take tranquilizers now, what will they do when they have to deal with unemployment, or a stressful job, or the loss of a loved one? I think these drugs should be left to those who really need them [...] (User6_2015).

I'm hyperactive. [...] I've taken "X," now I'm taking "Y." "X" in my view (from experience) is more aggressive than "Y." [...] Whoever wants to ask me something is welcome. I hope I have contributed with something that helps... (User9_2018).

In a conversation with a friend she said that she had started taking supplements, the name of which I no longer remember, and that every day she took a pill and on test and exam days she took it in a shot or something like that to help her concentrate and memorise the contents. I was a bit outraged because I had no idea that students had already reached this point and in conversation with other friends I found out that she was not the only one. I first thought this was a horrible thing, taking medication to be more attentive in school, and in a way I also think it's an injustice because if everyone starts taking it it's like we're one level below (User10_2018).

If you want something extra you will have to go into the nootropics: "E," "F" or something as basic as "G" the latter I have used sporadically and I can say I feel differences, it takes 30 min to take effect and lasts about 4h with no adverse effects (User11_2020).

4.2. *The dimension of sharing lay knowledge*

Another kind of interaction that emerges, not only directed at the initial requests but also at interventions by other participants, falls within the dimension of sharing lay knowledge (evocation of learning acquired through experience or through what others do, etc.), representing the most significant set of collected information (65 excerpts, or 60.2% of the total). Many of the participants in these virtual communities take the opportunity to make diagnoses, indicate the effects of drugs or supplements, and recommend ways of consumption and where to buy them, not based on any expert source and being laypeople themselves in the matter.

If you're talking about "H," you can even buy that imported, you don't need a prescription... Omega 3 is also good for concentration, for example (User12_2017).

Anyone who wants something better but is not into the pure amphetamine has always medicines: "I," "F" and "X" -all of which are used as academic doping. Whether they work or not is another matter, but if there are people giving \$ for placebos, there will also be people giving money for something with an active ingredient (User11_2018).

The effect of caffeine varies from person to person and also depends on how you consume it (for example: few amounts throughout the day or caffeine shots at lunch or in the morning). Speaking of what I feel; I feel my mind is more active and quicker, and I may or may not be a bit more rushed. All in all, I consider it a good drug if taken only when needed (User13_2021).

Regarding the discussion about the effects, there is a general tendency to point out the low effectiveness of supplements. In the case of medicines, concerns are raised about the possibility of dependence on these products.

Stimulants obviously have side effects such as hypertension, strokes... and of course, dependence. If in high school students already resort to these substances, then at university the doses will successively increase, causing various health risks ("intellectual doping" as it is known). Another issue is tranquilizers which do not usually have side effects and can be useful in extreme cases (User7_2016).

I've taken these supplements and, to be honest, I haven't noticed much of a difference. They work more like a placebo, in my opinion (User14_2017).

There are no clinical trials that prove the effectiveness of these products. As a general rule, they are a waste of money, because they work like vitamin supplements and if you want to get vitamins, it's best to have a proper diet and not spend money for nothing (User15_2020).

There are those who make other types of recommendations, as an alternative to the consumption of medication and supplements that may help with studying, although they are also based on lay sources. These include exercise, to have a balanced diet, and to sleep an adequate number of hours. It is also noteworthy that some respondents refer this kind of

advice to health professionals. Here, doctors appear as the main source of information, with no mention of pharmacists, for example. Reflection on forums/blogs as suitable means for sharing information on these issues is very low, but still, one participant voiced concern.

I'm not telling you not to take those pills or to stop taking them, but I think that if you're going to do that, you should consult someone who really knows what they're talking about –a doctor– and not just a bunch of explainers who blabber on. Even if it doesn't seem like it, it's a serious matter (User16_2015).

But if you want to try it, I advise you to talk to your GP and see which medicine best suits your needs :) (User14_2017).

[...] there is a time and place to get the information and the forum, as good as it is, is not the place for that, moreover, not everyone knows how to do a safe internet search and they may look at your comment as: ah! but doping doesn't do any harm! and go for it (User17_2018).

4.3. The dimension of sharing expert knowledge

A final behaviour that occurs less frequently is the sharing of expert knowledge (a total of 5 excerpts, or 4.6% of the total). Although this is not common, there are people who copy information from the package leaflet, from a reliable information site, or from scientific studies, to highlight the effects and purposes of medicines in an expert way, not based on their personal convictions. They may also include links to the information on the medicine available at INFARMED (National Authority of Medicines and Health Products, I.P.).

The forums are also spaces for sharing opinions/information that may not correspond exactly to what was asked, for unsolicited advice and other peripheral considerations. Sometimes they generate answers addressed not to the person who started the discussion, but to other participants who have expressed their opinions. This happens especially when the questions touch more sensitive and/or controversial issues, such as taking psychoactive drugs on one's own initiative, generating a parallel debate.

Now, excuse me. But do you have any idea of the side effects of "X" or "I" (which isn't even widely used here)? First, used without a prescription it is illegal because it is prescription-only and should only be given by medical specialists. Second, [...] come to your senses; if you want to do it, do it and deal with the harm, don't give ideas to other people who may come after you and be harmed because of it; yes, people have brains to think but many times those who resort to this kind of medicine are in a fragile state and want something to help (User17_2018).

This level of detail, with reference to brands of medicines, poses further questions related to the knowledge users of these forums have about these drugs. These findings are in line with previous studies (Lopes *et al.*, 2015, updated in Cavaco, Ribeiro & Norgaard, 2022) that point towards an existing trend in the consumption of cognitive-enhancing drugs among students.

5. Discussion and conclusions

There are certainly limitations to the present study, namely that conclusions are not intended to be extrapolated, but rather highlight some of these topics. Besides, one should be careful when working with indirect information, since it is impossible to guarantee its authenticity. Even so, having these considerations in mind, a few conclusions can be safely drawn and, hopefully, unveil new directions for future research. The first conclusion is that young people's use of online media, such as blogs and discussion forums, to ask questions related to health and, specifically, to the use of medicines and natural supplements for cognitive performance, seems a global practice. The results presented about young Portuguese people are similar to those reported in other countries, as mentioned in the theoretical framework section. This search was carried out mostly in forums dedicated to students and was mainly related to the topics of improving the effectiveness of studying, of reducing the feeling of

tiredness, and of improving concentration. These motives are well received by the participants in the forums, unlike other motivations that may be connoted with the intention to gain unfair advantage over peers in evaluations (the results are similar to those obtained by Vrecko, 2015 and Cavaco, Ribeiro & Norgaard, 2022). On the other hand, the collected information does not tell us directly what led young people to resort to the Internet for these purposes. However, based on previous studies, we believe that they do so due to a set of interconnected factors, namely the easy access to these means, the mastery of online communication and the guarantee of anonymity when dealing with a sensitive subject, which may keep young people away from health professionals.

There is a considerable dimension of conflicting views, perhaps due to the very nature of the empirical field, since these are generic forums/blogs dedicated to the student world, and not forums centred on a single subject, or the consumption of a particular drug, as found in other studies (Fox, Ward & O'Rourke, 2005; Souza, Marinho & Guilam, 2008). Here, despite an important sense of sharing, the shared identity is broader and not forged around consumption, so there is more room for different views on the topic. However, despite many dissenting opinions, the collected information points to the widespread practice of consumption for cognitive performance enhancement, associated with key moments of preparation for evaluations. This was observed in direct testimonies and in references to cases known to others and to the medicines in question. Although this study is only exploratory and does not claim to be an exact portrayal of reality, it seems to point to some clues that confirm the results obtained elsewhere (Vrecko, 2015; Lopes *et al.*, 2015; Cavaco, Ribeiro & Norgaard, 2022).

In fact, the collected information shows that one of the main reasons that leads students to seek blogs/forums/online media as a source of information is the possibility of sharing experiences. One of the most frequent aspects is request for help, especially to obtain information and share concerns. The analysed posts indicate that students seek the opinion of their peers regarding the intake of supplements or medicines to help them study, in order to obtain some kind of validation. In turn, these questions trigger other users in these forums/blogs to share their own experiences, or experiences they heard from others, through the description of therapeutic pathways (consumption, dosages, reactions), as well as an even greater sharing of lay knowledge (learning acquired through experience or through what others do, etc.). The sharing of expert knowledge is much less common.

We conclude, therefore, that the sharing of experiences in these environments is central to the validation of the practices and behaviours of young students and to their willingness to resort to such consumption. We are facing new contexts of sociability, based on anonymity and on a culture of individualisation, which seem to enhance the autonomy of consumption in a context of growing pharmaceuticalization of society, to which young students have revealed to be particularly receptive to (Lopes *et al.*, 2015). In conclusion, we believe that the aspects pointed out here justify further development of this line of research, not least to strengthen current studies on the topic of medication literacy.

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