Healthcare Research and Public Safety Journal

Academic Strive
Researcher's Perception is our Reality

Research Article *Volume 3 Issue 2*

Developing Strategies to Reduce Cognitive Enhancing Drug Usage: an Exploratory Study on User Perceptions in the Netherlands

Ravenswaaij HV*

Maastricht University, Netherlands

***Corresponding author:** Hilde van Ravenswaaij, Maastricht University, Godfried van Seijstlaan 59C, 3703BR, Zeist, Netherlands, Tel: +31613384607; Email: hildevr@outlook.com

Received Date: September 16, 2021; **Published Date:** October 05, 2021

Abstract

Context: Cognitive enhancing drugs (CED) can be beneficial in treating symptoms like fatigue, but usage can also cause heart conditions or loss of efficacy with long-term usage. The use of CED has been increasing worldwide, within medically diagnosed individuals and non-medically diagnosed individuals. Strategies to reduce CED use seem based on little available evidence and a knowledge gap has been found regarding the inclusion of user perceptions of strategies aiming at reducing CED use. This study aims to decrease this existing knowledge gap by exploring user perceptions of strategies aiming to reduce CED use in the Netherlands.

Methods: An exploratory research was conducted, with the use of online surveys. The surveys were developed based on literature, and distributed through snowballing via social media. Data were analysed with the program Atlas.ti, with an inductive form of coding.

Results: Participants (N=31) reported positive perceptions related to strategies such as offering therapies before prescribing CED to medically diagnosed individuals and reducing study pressure. Negative user perceptions were related to increasing the price of CED and mandatory CED tests before examination in educational institutions. Increasing barriers to obtaining CED was perceived as unfeasible by users. Further user recommendations focused on educational systems, alternatives, and organizational supervision.

Conclusion: This exploratory study offers a starting point for further research of the needed reduction of CED use, for public health benefit. A highlight is the potential efficiency of decreasing study pressure and overall stress to reduce CED use, as the majority of participants state this as cause for their CED use. The perspectives and ideas of participants revealed willingness to change and opportunities to effectively create this change. Future research should focus on preventative strategies, such as offering efficient therapies, reducing study pressure, and decreasing overall stress.

Keywords: User(S); Strategy/Strategies; Reduction/Reducing; Perception; Usage/Use; Explore/Exploratory; Prevention/Preventative

Abbreviation: CED: Cognitive Enhancing Drugs

Introduction

Cognitive enhancing drugs (CED) are defined as modern technologies which augment cognitive abilities and were developed to aid individuals diagnosed with certain diseases or disorders, like narcolepsy or attention deficit hyperactivity disorder [1]. CED can be beneficial in treating certain symptoms like fatigue or loss of focus. However, it has been found that usage can also cause loss of sleep, heart conditions, mood swings, diarrhoea, or loss of efficacy with long-term

usage [2,3]. Therefore, CED should be used with care to reduce health risks. Nonetheless, there has been a global rising trend in the use of CED, with for example a two-fold increase in total usage of CED in the United States of America in the last 15 years [4]. This increase is not only attributable to the rise in use of medical CED but also due to an increase in non-medical use [1,4,5]. Reasons for using CED without a medical diagnosis are to increase focus, support with studying, experiment, or recreational [5-7]. Furthermore, Peterson, Ølgaard and Nørgaard [8] reported that medical and non-medical CED use is especially widespread in students, with a prevalence of 2-20% worldwide.

Due to the associated health risks and increasing use, it is of public health benefit to develop strategies to reduce CED use. An increase of political, societal, and biomedical attention towards this phenomenon has been noticed globally, with people reporting against and in favour of it [9]. This global attention might explain the rise of research in the field, as lots of research has been conducted in the past few years regarding the health risks of CED usage [10], users perceptions [5,6,9,10] and possible influences on CED use [5,6]. These studies state alike health risks for medical and non-medical CED use, the user being aware of possible health risks and efficacy, and influences on CED use, such as the facilitation of social media as access and promotion of CED. Furthermore, as research has shown a lack of consensus among health professionals regarding health risks of non-medical CED use and societies perceiving CED as less dangerous compared to hard drugs, it provides users with the opportunity to legitimize their use of CED [8,9]. The users' opportunity to legitimize their CED use, the global increase of CED use, and the health risks involved all lead to the importance of carefully developing strategies that aim at the reduction of CED use. One of the key characteristics in developing strategies is the involvement of the target group, as it is essential for the quality and efficiency of the strategy to understand the perspectives and interests of all stakeholders involved [11,12]. However, a scientific knowledge gap has been found regarding the involvement of the target group, specifically regarding user perception of possible strategies, which aim to reduce the use of CED. It is important to reduce this knowledge gap, as the current strategies might not exist or might not be efficient in reducing CED use. For example, the European Medicines Agency advised that the availability of modafinil, a certain type of CED, should be more restricted, to reduce abuse by students [13]. However, modafinil was tested as a relatively safe drug and minimal evidence was present of students abusing modafinil [14]. Therefore, this research aims to decrease the existing knowledge gap, by exploring user perceptions of possible CED usage reduction strategies. It is important to explore the field, as the needed knowledge is lacking, but strategies are required to be made for public health benefit. This research is conducted in the Netherlands, as the country seems to have a relatively tolerant drug policy and tolerant societal views regarding drug use, compared to other countries [9]. For example, Dutch youth perceive CED as safer and less impactful compared to hard drugs [3]. These factors form the Netherlands as an interesting and fairly accessible country for researching user perceptions regarding CED. This research focuses on medical and non-medical CED use, as the health risks involved and the outcomes of possible strategies might affect all users [1-3]. It is of scientific and societal relevance, and public health benefit, to reduce the knowledge gap regarding user perception of possible strategies aiming at reducing CED use. The following research question aims at exploring the perception of CED users regarding certain strategies: ''what are user perceptions of strategies aiming at reducing cognitive enhancing drug use in the Netherlands?''.

Methodology

Study Design

Research has found that most users without a medical diagnosis obtained CED via medically diagnosed peers [1]. The method of obtainment of CED is, therefore, a focus of the following three strategies which are included in this study:

- Offering therapies before prescribing CED to medically diagnosed individuals, to reduce the supply of CED to medically diagnosed and indirect non-medically diagnosed users;
- Increasing the price of CED, to reduce the demand for CED by medically diagnosed and non-medically diagnosed users [15].
- Increase barriers to obtaining CED, to reduce the demand for CED by medically diagnosed and non-medically diagnosed users.
- Furthermore, research found a relationship between stress and the need for CED, for either medically diagnosed or non-medically diagnosed users [5-7]. Together with the widespread use of CED in students [8], the following strategy is included:
- Reduction of study pressure in educational institutions, to reduce the demand for CED by medically diagnosed and non-medically diagnosed users.

Lastly, the relevant societal discussions regarding the ethical dilemma of non-medical CED for studying purposes is considered cheating or not and how to possibly battle this issue [9,16], lead to the inclusion of the fifth strategy in this study:

- Application of mandatory CED tests before exams in educational institutions [16], to prohibit the direct use of CED; up to four days before the exam, depending on the half-time of the CED.

Based on the aim of this research, the exploration and understanding of perspectives of the target group, CED users a qualitative method of data collection will be executed. An online survey as qualitative method of data collection is deemed appropriate for its aim, as Storvang, Haug, & Nguyen [17] stated that user perception can be obtained through surveys. Ethical regards of this research can be found in Appendix I.

Setting

The survey, stated in Appendix II, was developed in English to enhance its reliability. The questioned strategies in the survey were based on related studies in the field, enhancing generalizability by comparing similarities between studies [18]. The participants were eligible to be included in the online survey based on three requirements: the individual is at least aged 18; the individual resides in the Netherlands at the time of participation; the individual has used CED at least once in the past twelve months. The individual had to be at least 18 years of age to avoid ethical issues and the individual had to reside in the Netherlands at the time of participation, as this was the country of interest. Furthermore, the individual had to have used CED at least once in the past twelve months, as research found that users of substances often vary their use over time [19]. To ensure memory recall of participants, the time frame of twelve months has been chosen. Galvani [19] also found that there is no easy stereotype defined for people using substances, which explains why only requirements for participation were used regarding ethics and the research aim.

Data Collection

It is important to note that questions stated in surveys can imply certain codes [20], which require the need for careful development of the survey. Peer checking was conducted when discussing the design of the survey and pilot-testing the survey with the supervisor and direct colleagues of the author. It is essential to be aware of the possibility that the design of the questions and process of coding might involve some sort of judgement by the author Vogt, et al. [20], which makes constant awareness of limitations regarding subjectivity increasingly important. The survey was designed with the use of the program Qualtrics, contained a total of twenty questions, and participation took approximately five to fifteen minutes, according to a computed estimation of Qualtrics. The participants were recruited through snowball sampling via posting of the survey on the following social media accounts of the author: LinkedIn, Instagram, Snapchat, Facebook and WhatsApp. This snowballing method of survey distribution could lead to a certain type of participants, but it is one of the few efficient methods of reaching substance users [21]. The posting of the survey occurred three times between April 18th, 2021 and May 2nd, 2021, with four to five days in between the posting. Participation was fully anonymous and of free choice, and no incentives to participate were used. The risk of participants responding to the survey more than once from the same device had been reduced by activating the ''Ballot Box Prevention'' option in Qualtrics, which placed cookies in the web browser of participants, in line with the General Data Protection Regulation of Maastricht University. The survey consists out of two parts, with the first part questioning participants' characteristics and closed questions on CED use. The second part of the survey assesses open-ended questions on user perception of different strategies. After collection, the data were downloaded from Qualtrics onto the password-protected computer of the author and password-protected I: Drive of Maastricht University. Data were deleted on Qualtrics after this download occurred. The data were collected and stored by the author in the first half of the given timeframe for this research. This research was explained to participants via a short posting on social media and via a short introduction, with a summative informed consent, stated at the beginning of the survey.

Data Analysis

The first question of the survey asked participants if they had used CED at least once in the past twelve months, all participants who answered this question with ''no'' were excluded from completing the survey. It is important to note that the other two requirements, regarding age and current residency, were completely dependent on the honesty of participants, as the online survey was fully anonymous. Data were analysed by the author with the use of the software programs SPSS and Atlas.ti. The program SPSS was used to check for descriptive statistics of characteristics of participants, namely the number of participants, average age, gender, level of education, medical diagnosis, type(s) of CED used, and how often participants have used CED in the last twelve months. The test used in SPSS was: Analyse > Descriptive Statistics > Descriptive. The program Atlas.ti was used to analyse the qualitative data through coding. Steps taken to guard against selectivity in the use of data were the following; anonymised data, analyse all responses per question instead of per participant, and, including all data gathered in analysis. Data were analysed and coded per question and was coded with an inductive approach, as this method is relevant when conducting exploratory research [20,22]. Data were not coded in vivo, as participants sometimes responded with grammatical errors and the author did not edit data. The results of the coding process were interpreted by checking for themes, to reach a smaller number of codes [22]. The codes included themes based on existing literature, to lift the data analysis to a higher level [23]. As it is barely possible to determine whether a perception stated by one participant refers to the same perception stated by another participant [24], the broad

themes ''negative perception'' and ''positive perception'' were used with questions related to the strategies. The number of codes and themes were checked in Code Manager in Atlas.ti and saved.

ResultsOne participant answered two questions in Dutch, which were later translated by the author. Some participants did not answer all questions, however, this was not required by the survey. The first few questions of the survey concerned general questions about the user, followed by in-depth questions focused on assessing the research question: ''What are user perceptions of strategies aiming at reducing cognitive enhancing drug use in the Netherlands?''. As Figure 1 shows, a total of N=42 participants started the survey. The first question of the survey, a control question, had been answered positively by n=31 participants and negatively by n=11 participants.

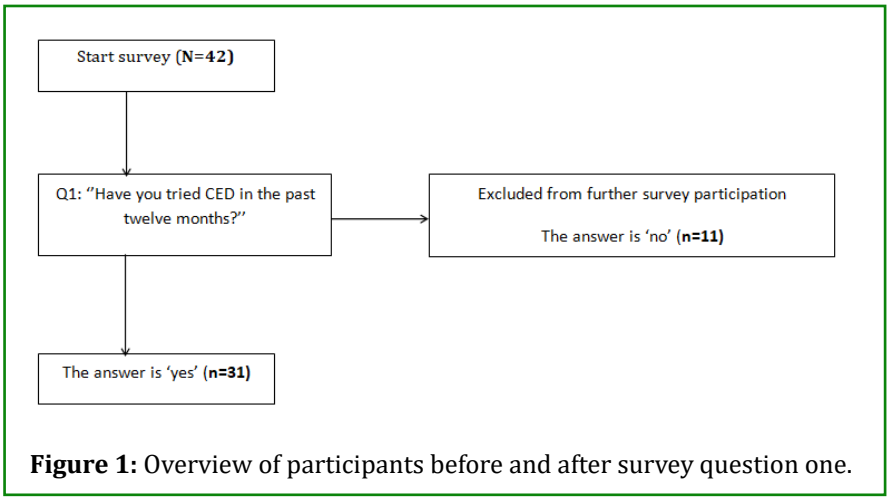

Figure 1: Overview of participants before and after survey question one.

The next six questions were analysed with SPSS, of which a clear overview has been given in Table 1. A total of n=14 participants identified as male (45.2%) and n=17 participants identified as female (54.8%). The third question asked participants what their age was at the moment of conducting the research, with n=23 participants answering this question. The average age of n=23 participants is 22,7 years, with a lowest of 20 years and highest of 26 years of age. The next question regarded asking the participants about their highest level of education, with either a received diploma or current enrolment. A total of 70.9% of the participants (n=22) were enrolled or received a diploma of university-level at the time of conducting the research. Six participants answered University of Applied Sciences, one participant noted Secondary Vocational Education and Training, and two participants stated High School. Question five of the survey examined if participants were medically diagnosed with a disease or disorder which required the use of CED. Twelve participants answered this question with 'yes' (38.7%) and n=19 participants answered this question with 'no' (61.3%). Furthermore, participants were asked which kind (s) of CED they had used in the past twelve months.

Overall, n=29 participants answered this question, of which n=26 had used methylphenidate (89.6%). Other types of CED used were dexamphetamine (n=7) and modafinil (n=3). In total, n=8 participants answered they had used more than one type of CED. The next question asked participants about how often they had used CED in the past twelve months, n=28 participants answered this question. Most participants (n=13) used it 'only with coming exams', of which n=9 combined it with other types of use like 'only with coming deadlines' or 'only with parties'. One participant used CED once in twelve months, two participants used CED once in six months, four participants used CED once in three months, three participants used CED once per months, and three participants used CED twice per month. Four participants used CED daily, thirteen participants used CED only with coming exams, seven participants used CED only with coming deadlines, five participants used CED only with parties, and one participant used CED only with friends. Three participants used CED for other reasons, such as feeling overwhelmed. For a clear overview of these results, please check Table 1. The first question analysed with Atlas.ti examined the method of obtainment of CED by participants. Overall, n=27 participants answered this question and Table 1 shows the codes analysed. Most participants (n=16) seem to obtain CED via peers. Other methods of obtainment were the pharmacy (n=8), the internet (n=2), and the internet and/or peers (n=1).

Participant Characteristic	Total Response	Detailed Response	Detailed Description
Gender	N=31	N=17	Female
		N=14	Male
Age	N=23	22.7	Average age of 23 respondents
Level of education	N=31	N=0	No diploma/not enrolled
		N=2	High school
		N=1	Secondary Vocational Education and Training
		N=6	University of Applied Sciences
		N=22	University
Medical diagnosis	N=31	N=19	No
		N=12	Yes
Type of CED used (Note: some participants used multiple types of CED)	N=29	N=26	Methylphenidate
		N=7	Dexamphetamine
		N=3	Modafinil
How often CED used (Note: some participants used CED on multiple occasions)	N=28	N=1	Once in twelve months
		N=2	Once in six months
		N=4	Once in three months
		N=3	Once per month
		N=3	Twice per month
		N=0	Once per week
		N=0	Two or three times per week
		N=4	Daily
		N=13	Only with coming exams
		N=7	Only with coming deadlines
		N=5	Only with parties
		N=1	Only with friends
		N=3	Other, namely:
			P5: ''Previous year daily''; P12: ''sometimes when i am drinking alcohol a party'' and; P24: ''When I feel overwhelmed''.
Method of CED obtainment	N=27	N=16	Peers
		N=8	Pharmacy
		N=2	Internet
		N=1	Internet and/or peers

Table 1: Overview of participant characteristics.

To explore the field, five strategies were presented to the participants, followed by a few questions on the thoughts of participants regarding the societal discussion of CED, their CED use, and their recommendations for strategies. Table 2 shows a summarizing overview of the data analysis regarding all five strategies.

Strategy	Positive perception	Negative perception	Not clear	Perceived efficiency	Detailed description	Quote positive perception	Quote negative perception
1	N=28	N=2	N=1	Efficient	Efficient, given that therapy needs to be effective and well-organized. Worries for health risks if users switch to other drugs.	P31: ''... people that have CEDs prescribed often do not take it because it changes them so much/ they do not like it''	P21: ''No therapy is going to help since it is caused by a deregulation of the dopamine system in neurotransmitters''
2	N=2	N=25	N=4	Not efficient	Worries for negative side-effects being greater than positive side-effects. Worries for risk of inaccessibility of healthcare.	P27: ''Economic incentive is often a good stimulance (especially in the Netherlands)''	P21: ''It is already very expensive and health insurers do not cover (all of) it''
3	N=11	N=16	N=4	Equally efficient as not efficient	Doubt about feasibility strategy. Worries for risk of inaccessibility of healthcare.	P26: ''This should be the way to go, for me it was pretty easy to get te prescription, just tell my doctor i think i need them, and thats how i got them, it was only after they gave me the medicine, that they diagnosed ADD ''	P24: ''Current protocol is sufficient. I already have heavy restrictions in how many pills per time I can buy to avoid reselling''
4	N=17	N=4	N=10	Efficient	Study pressure given as main cause for using CED. Options for reducing study pressure were stated. Worries for quality of education. Worries for efficiency in reducing CED in recreational users.	P8: 'In my case, my taking of Concerta is all to blame to study pressure''	P7: ''Pressure is a part of life so necessary in education''
5	N=1	N=14	N=16	Efficient	Worries for negative side-effects being greater than positive side-effects. Worries for privacy and fairness. Worries for efficiency inreducing CED in recreational users. Worries for dodging the CED-test.	P28: '' This would probably be the most effective for me''	P11: 'I think it would reduce [CED] use, but also decrease students' results''.

Table 2: Overview of user perceptions of the five questioned strategies.

Strategies

Strategy 1: Offering therapies before prescribing CED to medically diagnosed individuals: The analysis showed that 28 out of 30 participants perceived this strategy as positive. It was also mentioned that there needs to be more societal acceptance of diseases and disorders which require the use of CED, instead of prescribing CED to fit 'normative society'. A total of two participants perceived this strategy as negative, as they mentioned to

either have no trust in the related health professionals or have no trust in the efficiency of therapies. It was mentioned by multiple participants that this strategy can be efficient in reducing CED use, provided that therapies are efficient. Noticeable is that participants who did not perceive this strategy as efficient, mentioned the easiness of obtainment via the internet instead of peers, and the risk of users shifting to other, lesser-known CEDs, with more health risks.

Strategy 2: Increase the price of CED: This strategy was perceived negative by 25 out of 27, with the risk of lack of accessibility of healthcare as one of the main arguments mentioned. Two participants perceived this strategy as positive, because of arguments related to economic incentive. Participants mostly perceived this strategy as not efficient, with the most often mentioned argument of negative side-effects being greater than positive side-effects.

Strategy 3: Increase barriers to obtaining CED: The overall perception of this strategy was viewed almost equally negative (n=16 out of 27) as positive (n=11 out of 27), and most of the participants found this strategy not realistic. The perceived efficiency of this strategy was also distributed equally negative as positive in codes. The overall positive perception of efficiency regarded the reduction of supply and demand and the overall negative perception of efficiency regarded the negative side effects such as loss of accessibility of healthcare.

Strategy 4: Reduction of study pressure in educational institutions: Four out of 21 participants perceived this strategy as negative, with reasons such as the need for pressure and the attitude of current students. This strategy was viewed positively by 17 out of 21 participants. Four participants mentioned this strategy as a good start, whereas other participants mentioned specific needed changes in the educational system to reduce study pressure. The efficiency of this strategy was also perceived as mainly positive. The majority of participants stated study pressure as their main cause for using CED. Negative perceptions of efficiency of this strategy, which were mentioned twice, regarded that CED use is dependent on the individual and the type of use; this strategy would not be efficient in reducing CED in individuals who use it as recreation.

Strategy 5: Application of mandatory CED tests before exams in educational institutions: Fourteen out of 15 participants perceived this strategy as negative, whereas one participant perceived this strategy as positive. The overall negative perceptions regarding this strategy were focused on fairness, privacy issues, feelings of control, risks of the CED test, a burden on educational institutions, and accessibility of healthcare. However, all fourteen participants perceived this strategy as efficient, as it aims to prohibit CED use directly. Four participants did not perceive this strategy as efficient, as stated it was deemed highly likely that individuals would switch their time-frame of use or the type of CED used, to dodge the CED test.

User recommendations on CED Strategies

Table 3 shows an overview of the number of codes analysed per theme of user recommendations on CED strategies. Most recommendations regarded offering alternatives to CED and modifying the educational system. A high proportion of participants (n=13) stated recommendations, which were coded as ''alternatives'' as they focused on alternative options or strategies for CED use. Three participants mentioned how all users, with or without a medical diagnosis, should be educated on CED. Four participants described the need for therapies and specialized CED advice regarding which type and what usage fits best. Noticeable are the recommendations regarding the method of CED obtainment, with two participants in favour of increasing barriers to obtainment (to weaken the criminal circuit) and three participants in favour of reducing barriers to obtainment (to reduce CED use). One of the recommendations "stop describing CED to youth" was explained as the education system needing to adapt more to individuals instead of individuals adapting to the education system. The participant (P23) mentioned how in the current system CED is prescribed too quickly to young individuals who are perceived as too active or nosy. Seven participants mentioned other recommendations, such as the need for more focused research in this field. Two participants stated the need for an increase in control on either pharmacy sales of CED or patient use of CED.

Coding Theme	Number of Codes	Number of Codes	Detailed Description
Educational system	4	2	Reduce study pressure
		1	Reform educational system
		1	Stop describing CED to youth
Supervision	2	1	Control patient CED use
		1	Control pharmacy CED sales

Alternatives	13	2	Adapt CED use and therapy to the individual
		4	Offer specialized CED advice and therapy
		3	Educate CED users
		3	Offer other options before prescribing CED
		1	Offer non-CED options to enhance focus
Method of obtainment	5	3	Reduce barriers to obtainment to weaken criminal circuit
		2	Increase barriers to obtainment to reduce use
Other	7	3	More focused research needed
		1	Do not increase price of CED
		1	Doubting feasibility of reducing CED use overall
		1	No idea
		1	No opinion
		0	No response

Table 3: Number of codes per coding theme of user recommendations on CED strategies.

Perception of Societal Discussion on CED Reduction

The participants were asked about their perception of the arising societal discussion on CED use and possible reduction of CED use. Twelve participants described understanding of the discussion, as they mentioned CED are either dangerous, unhealthy, unnatural, or bad. Furthermore, two participants stated to have no opinion on this discussion and nine participants mentioned alternatives instead of reducing CED itself. Alternatives were stated such as more the need for more research on the topic, the reduction of performance- and study pressure, and the need for education on CED use. Six participants described they did not understand the need for strategies to reduce CED use, as they perceived CED as not 'bad', for example, P22: ''CED has more potential than only for clinical use'' and P4: ''I don't see them as a bad thing, that should be reduced''. Participants did seem to describe defence against the societal discussion on CED reduction, for example, P23: ''… personally I see CED's as a necessary evil'', P29: ''It doesn't answer the need for students to focus/motivate in this 24/7 world where everything is about deadlines and performing'', and P31: ''I can imagine it creates uneven chances for other people who cannot obtain/use CEDs for exams, therefore it not fair. But for health reasons I do not think it is such a big problem''.

Perception of Personal CED use

Participants were questioned what their reasons for using CED were and what they thought of their use. A total of fifteen participants mentioned using CED for an improvement in study results, n=6 participants mentioned using CED to increase energy levels, n=5 participants mentioned using CED recreational, n=4 participants mentioned using CED for reduction of stress, and one participant mentioned their medical diagnosis as the reason for CED use. Overall, eight participants described negative health effects of CED, however, nine participants described experiencing more beneficial effects, compared to negative effects of CED use. Nine participants stated not using CED "too often", as they described that using CED "too often" is either unhealthy or brings no more beneficial effects compared to negative effects, for example, P12: ''And long time ago I told myself that I don't want to use these pills [CED] to concentrate for the rest of my life. When I was young and used this daily I was very down, …'' and P10: ''I liked that it made me feel more focused, …, but I would not do it often''. Furthermore, there were a few participants who only used it recreationally and did not state what they thought of their CED use, for example, P2: ''Sniffed it [CED] once for fun'' and P31: ''… for parties when I do not want to take 'hard drugs', then Ritalin is my more safe alternative''.

Discussion

The almost equal distribution of gender identity in this research (45.2% male and 54.8% female) has also been found in other studies related to CED use [8]. The average age of participants in this research, 22.7, is similar to the demographic characteristics of participants in other studies regarding CED use [6,8]. Participants in this research were mostly categorized as students, as 70.9% responded with the university as the highest level of (current) education. It has also been found by Peterson, et al. [8] that CED is used especially by students. A total of 38.7% of the participants in this research stated the need for CED, because of a medical diagnosis. This percentage is higher compared to the relatively low prevalence of CED use in the Netherlands and global prevalence (2-20%) of CED use in students [8,11]. A reason could be that the participants of this research

were not only students, or, that individual with a medical diagnosis felt interested in the survey regarding CED. The results also showed that participants used CED most often for reasons related to studying, which is in line with other related research [5-8]. Furthermore, in line with Nicholson, et al. [1], who found that most users without a medical diagnosis obtained CED via peers, the results of this research show 57.1% of participants having obtained CED via peers. The type of CED which was used the most by participants was methylphenidate, which has also been found in another study [6].

Strategy Findings

The results of this research show an overall positive user perception of offering therapies before prescribing CED to medically diagnosed individuals. This is in line with studies related to other types of drugs [25,26]. The participants also stated the need for efficient therapies and some participants stated distrust in health professionals or therapies. According to CED users and related studies, this strategy reveals potential to effectively create the needed change in CED use. Future research should investigate the efficiency of Dutch therapies and users' needs in therapies. Furthermore, the results show negative user perception towards increasing the price of CED, with the main argument the risk of causing inaccessibility of health care. Research by Kourany [27] stated that full access and use of CED should be important to keep in mind, as inaccessibility might result in inequality between socio-economic groups in society. With both medical and non-medical use of CED, increasing the price of CED might lead to inequalities, as the already well-resourced group has the benefit of still being able to obtain CED. However, it has been found that drug use by youth and adolescents is more sensitive to price changes than older adults [15]. Grossman [15] also stated that with the development of strategies, the costs of eliminating the harms should not be greater than the costs arising from the harms. These costs could be monetary but also related to health and quality of life. Therefore, accessibility of health care, like the participants in this study stated, should be an important factor to keep in mind while developing strategies. One may question the efficiency of raising the price of CED, keeping in mind the worries of participants and possible negative side-effects of this strategy. This strategy does not seem to accommodate potential to effectively reduce CED use. The results show an equal positive as negative user perception of the strategy of increasing barriers to obtainment of CED. Most participants doubted the feasibility of this strategy. Rolles [28] found that consensus is growing on the idea that prohibition of (parts of) the drug cycle, has failed its aims and has been counterproductive. The failure of drug prohibition, together with the worry of participants about the accessibility of healthcare, lead to the idea of this strategy not being feasible and efficient to reduce CED use.

The results showed a positive user perception towards reduction of study pressure in educational institutions. Heaps of participants stated study pressure and related stress as the main factors for the personal use of CED. Di Giovanni [29] stated that, with other addictive substances, reducing stress in daily life may result in the prevention of substance use. Another study, by Gabatz, et al. [30], found that individuals' search for drugs is related to inabilities to cope with stressful events. This strategy revealed users' willingness to change and exposed potential for efficiently reducing CED use. Future research should investigate efficient methods of reducing study pressure and overall stress in Dutch adolescents, aiming to prevent adolescents from using CED and other addictive substances. The results of this research stated an overall negative perception of a CED test before examination in educational institutions. Noticeable was that participants mentioned topics like fairness, privacy, and cheating while elaborating their negative perception on the strategy. Expert opinions on the discussion if CED use is cheating or not and the possible potential of CED, differ greatly [27]. To the best of the author's knowledge, no other literature on CED tests before examination in educational institutions has been found. As mentioned before, the aim of prohibition of (parts of) the drug cycle, like prohibiting the use of CED at the examination in educational institutions, could fail or even be counterproductive [28]. Therefore, this strategy seems inefficient to further explore.

Recommendation Findings

Recommendations mentioned by participants seem to be aligned with their perception of the questioned strategies. The recommendations being stated by participants in this research seem to be in line with other studies, for example, the need for more research on this topic, the need for educating CED users, the need for reforms in society, the need for reforms in educational institutions or the need for reduction of study pressure [25,31,32]. Overall, the participants of this study recommend prevention above cure, by stating the need for therapies, reforms, and educating users. With other types of drugs, educating users about the health risks associated with using drugs has been a well-known component in prevention strategies [33]. More studies related to other drugs, like marihuana or cocaine, also recommend prevention as a powerful tool to reduce negative consequences of drug use [26,28]. Another alternative, the need for effective therapies instead of prescribing CED as the first option, was stated multiple times by participants. This is in line with Flora [25], who stated that behavioural therapy should be the norm, and drugs, combined with therapy, should be the very last option. Flora [25] also stated that behavioural therapy is more effective and provides fewer negative side effects, compared

to drug therapy. The recommendations of CED users seem to reveal willingness to change and opportunities to create this change efficiently.

Societal Discussion Findings

As an increase of global attention has been noticed towards CED use, with people in favour and people against it, participants were questioned on their perception of this societal discussion. The question related to societal discussion resulted in multiple statements, of which some participants seem to understand the discussion and some participants do not. This is in line with previous studies, wherein experts also seem to have different understandings on discussions related to CED and reduction of CED [9,16,27]. Noticeable was the number of alternatives stated by participants, which could be a possible implication of participants not agreeing with the discussion on reduction of CED or its related possible strategies. Participants in this research also viewed CED not as 'bad' as other drugs, in accordance with the conclusion by Ganpat, et al. [3].

Personal CED use Findings

Participants mentioned the positive and negative health effects of using CED, the reasons for using CED, and the awareness of risks with using CED. This is in line with other studies which stated that CED users seem to be aware of their use and related health risks [5,6,9,10,34].

Limitations

A limitation of this research is that a relatively small number of participants, N=31, completed the survey. The sample of participants was tested on normal distributions, but no normal distributions were found, likely because of the sample size. However, as open-ended questions tend to produce richer data, fewer participants were needed to produce an understanding of the topic [35]. Furthermore, the demographic characteristics of participants of this research seemed to be in line with other studies in the area. However, the generalizability of this research is considered not high, as this study aims to explore [18].Another limitation was the possible selection bias, as most of the participants (N=22) were enrolled or received a diploma at the university level. This could be the result of the biased method of distribution of the survey, namely via the author's network. It could also be in line with most studies, which show a high prevalence of CED use among students [8]. Another limitation of data collection was the fact that participants were required to reside in the Netherlands, but were requested to answer in the English language. This might influence the explanation of participants, but reduces the chance of translation issues. Furthermore, as Vogt, et al. [20] and Linneberg & Korsgaard [22] stated, the possibility of involvement of judgement by the author while analysing data exists. To reduce this possible bias of interpretation, the coding scheme was broadly based on the two themes ''negative perception'' and ''positive perception''. However, the results could therefore be biased, as some participants might have a positive or negative perception, but did not state it 'clear' enough for the coding theme and were thus left out of the number of positives or negatives coded. Moreover, member checking was not possible, as participants responded fully anonymous. To increase transparency in the results, detailed descriptions of user perceptions per strategy were stated in Table 2 [22]. Future research should include multiple researchers or multiple points in time during data analysis, to increase inter-rater reliability or intra-rater reliability.

Conclusion

The global increase in CED use and its related health risks, for medically diagnosed users as well as non-medically diagnosed users, leads to the importance of decreasing the existing knowledge gap, by exploring user perceptions of possible strategies aiming at reducing CED use. It is important to explore the field, as the needed knowledge is lacking, but strategies are required to be made for public health benefit. Results of this study overlap with results of other studies related to the characteristics of participants, user perception of personal CED use, and user perception of the societal discussion related to CED reduction. Results of this study which contribute to the reduction of the existing knowledge gap related to the user perception of strategies aiming at the reduction of CED use. Overall positive user perceptions were related to preventative strategies, such as offering therapies before prescribing CED to medically diagnosed individuals and reducing study pressure [36]. Negative user perceptions were related to increasing the price of CED and mandatory CED tests before examination in educational institutions. A strategy related to increasing the barriers to obtaining CED was deemed unfeasible. Further user recommendations related mostly to the educational system, alternatives, and organizational supervision. This exploratory study offers a starting point for further research of the needed reduction of CED use, for public health benefit. Users positively perceive and recommend preventative strategies to reduce CED use in the Netherlands. A highlight is the potential efficiency of decreasing study pressure and overall stress to reduce CED use, as the majority of participants state this as cause for their CED use. The perspectives and ideas of participants revealed willingness to change and opportunities to effectively create this change. Future research should focus on preventative strategies, such as offering efficient therapies, reducing study pressure, and decreasing overall stress.

References

1. Nicholson PJ, Mayho G, Sharp C (2015) Cognitive enhancing drugs and the workplace. BMA. London, pp: 1-19.

2. Sluiter MN, Vries DYA, Koning LG, Hak E, Bos JH, et al. (2020) A prescription trend analysis of methylphenidate: relation to study reports on efficacy. Administration and policy in mental health and mental health services research 47(2): 291-299.

3. Ganpat S, Kleinjan M, Mheen DVD (2009) Oneigenlijk medicijngebruik onder Nederlandse jongeren: aard en omvang. Rotterdam: Instituut voor Verslavingsonderzoek (IVO).

4. Piper BJ, Ogden CL, Simoyan OM, Chung DY, Caggiano JF, et al. (2018) Trends in use of prescription stimulants in the United States and Territories, 2006 to 2016. PloS one 13(11).

5. Teter CJ, McCabe SE, LaGrange K, Cranford JA, Boyd CJ (2006) Illicit use of specific prescription stimulants among college students: prevalence, motives, and routes of administration. Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy 26(10): 1501-1510.

6. Dupont RL, Coleman JJ, Bucher RH, Wilford BB (2008) Characteristics and motives of college students who engage in nonmedical use of methylphenidate. American Journal on Addictions 17(3): 167-171.

7. Schelle KJ, Olthof BM, Reintjes W, Bundt C, Vermeer JG, et al. (2015) A survey of substance use for cognitive enhancement by university students in the Netherlands. Front Syst Neurosci 9(10).

8. Petersen MA, Ølgaard LJLD, Nørgaard LS (2019) Contextualizing study drugs-An exploratory study of perceptions and practices among study counselors, general practitioners, psychiatrists and from student polls. Res Social Adm Pharm 15(10): 1204-1211.

9. Hupli A (2013) Perceptions, practices and ethics of (non)-prescription cognitive enhancement drugs: a case study among academic youth in Amsterdam. Master's Thesis in Medical Anthropology and Sociology. Faculty of Social and Behavioural Sciences, University of Amsterdam.

10. Hupli A, Didžiokaitė G, Ydema M (2016) Toward the smarter use of smart drugs: Perceptions and experiences of university students in the Netherlands and Lithuania. Contemporary Drug Problems 43(3): 242-257.

11. Heclo HH (1972) Policy analysis. British journal of political science 2(1): 83-108.

12. Benoit F (2013) Public policy models and their usefulness in public health: The stages model. National Collaborating Centre for Healthy Public Policy, Institut national de sante publique Quebec.

13. EMA (2010) European Medicines Agency recommends restricting the use of modafinil, Press Release.

14. Coveney C, Williams SJ, Gabe J (2019) Enhancement imaginaries: exploring public understandings of pharmaceutical cognitive enhancing drugs. Drugs: Education, Prevention and Policy 26(4): 319-328.

15. Grossman M (2004) Individual behaviors and substance use: the role of price. National Bureau of Economic Research.

16. Marsh S (2017) Universities must do more to tackle use of smart drugs, say experts.

17. Storvang P, Haug A, Nguyen B (2020) A typology of strategies for user involvement in innovation processes. Prometheus 36(4): 347-365.

18. Leung L (2015) Validity, reliability, and generalizability in qualitative research. Journal of family medicine and primary care 4(3): 324-327.

19. Galvani S (2012) Supporting People with Alcohol and Drug Problems : Making a Difference. Policy Press, pp: 296.

20. Vogt WP, Gardner DC, Haeffele LM, Vogt ER (2014) Selecting the right analyses for your data: Quantitative, qualitative, and mixed methods. Guilford Publications, pp: 500.

21. Shewan D, Dalgarno P, Reith G (2000) Perceived risk and risk reduction among ecstasy users: the role of drug, set, and setting. International Journal of Drug Policy 10(6): 431-453.

22. Linneberg MS, Korsgaard S (2019) Coding qualitative data: A synthesis guiding the novice. Qualitative Research Journal 19(3).

23. Gioia DA, Corley KG, Hamilton AL (2013) Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. Organizational research methods 16(1): 15-31.

24. Lavrakas PJ (2008) Encyclopedia of survey research methods. Sage publications.

25. Flora SR (2007) Taking America off drugs: Why behavioral therapy is more effective for treating ADHD, OCD, depression, and other psychological problems. SUNY Press, pp: 1-190.

26. Fisher GL, Roget NA (2008) Encyclopedia of Substance Abuse Prevention, Treatment, and Recovery. SAGE Publications, Inc, pp: 1-152.

27. Kourany JA (2014) Human enhancement: Making the debate more Productive. Erkenntnis 79(5): 981-998.

28. Rolles S (2010) An alternative to the war on drugs. Bmj 341: 127-131.

29. Giovanni GD (2012) Nicotine Addiction: prevention, health effects and treatment options. Nova Biomedical.

30. Gabatz RIB, Johann M, Terra MG, Padoin SMDM, Silva AAD, et al. (2013) Users Perception About Drugs In Their Lives. Escola Anna Nery 17(3): 520-525.

31. Outram SM (2010) The use of methylphenidate among students: the future of enhancement? J Med Ethics 36(4): 198-202.

32. Hills T, Hertwig R (2011) Why aren't we smarter already: Evolutionary trade-offs and cognitive enhancements. Current Directions in Psychological Science 20(6): 373-377.

33. Lipari R, Francois BJ (2016) Trends in perception of risk and availability of substance use among full-time college students. The cbhsq report.

34. Petersen MA, Petersen IL, Poulsen C, Nørgaard LS (2021) # studydrugs–Persuasive posting on Instagram. Int J Drug Policy.

35. Vasileiou K, Barnett J, Thorpe S, Young T (2018) Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. BMC Med Res Methodol 18(1): 148.

36. Kawachi MDI, Subramanian SV (2021) Social Science & Medicine.