Article

Pharmacies as potential providers of harm reduction services: A preliminary online survey

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Abstract

Background: Recreational drug use is a major cause of disease, injury, physical and mental impairment and death in developed countries such as the United Kingdom and the United States. Alcohol, tobacco, cannabis, 3,4-methylenedioxymethamphetamine (MDMA) and psilocybe mushrooms are recreational drugs with capacity to cause harm. Cannabis, MDMA and psilocybin have reported therapeutic applications.

Objectives: The primary purpose of this study was to determine which of the three types of vendor (pharmacy, shop and the black market) are perceived to be the most suitable for selling the substances discussed according to a general population sample.

Methods: A sample of 105 UK nationals was selected for the survey. Participants were presented information regarding reported relative dangers of alcohol, tobacco, cannabis, MDMA and psilocybin and potential therapeutic applications. Participants were then asked to review harm reduction strategies.

Results: It was found that participants concluded that pharmacists with available NHS support from GPs and mental health workers are the most suitable vendors of cannabis, MDMA and psilocybin as opposed to regulated shops or the black market (p < 0.001). There was a high level of support for selling cannabis in pharmacies both for therapeutic use and for harm reduction purposes with a mean score of 7.0 out of 10. Participants (60) with a university education were found to be more in favour of the substances being sold primarily in pharmacies (alcohol 5.6, tobacco 6.7, cannabis 7.6, MDMA 6.5 and psilocybin 6.5) than participants (45) with no university qualification (alcohol 5.0, tobacco 4.8, cannabis 6.3, MDMA 5.0 and psilocybin 5.1).

Conclusions: The data suggest that the university-educated participants are supportive of treating recreational drug use as a health issue with GPs, mental health workers and pharmacists taking on roles.

Introduction

Recreational drug use is one of the leading causes of disease and premature death in the United Kingdom with alcohol and tobacco being the primary causative agents (ASH, 2015; Connor, 2016; Health and Social Care Information Centre, 2015; Nutt and Rehm, 2014). Alcohol causes a significant amount of damage to society and costs the National Health Service (NHS) £billions each year (Balakrishnan et al., 2009; Boles and Miotto, 2003; Bushman and Cooper, 1990). Less harmful substances of abuse (van Amsterdam et al., 2015) with potential therapeutic applications such as tetrahydrocannabinol and other cannabinoids (Grotenhermen and Muller-Vahl, 2012),

3,4-methylenedioxymethamphetamine (MDMA) (Sessa and Nutt, 2015) and psilocybin (Johnson et al., 2014) are not legally available at any form of retailer or dispensary in the UK (Nutt, 2014). However, the UK has some of the highest levels of recreational drug use in Europe (EMCDDA, 2011).

Since the 1971 Misuse of Drugs Act, there has been around a 13-fold increase in cannabis use with over

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10 million 16–59 year olds in England and Wales and around 20% of young people reporting that they have used cannabis (Weissenborn and Nutt, 2012). As prohibitory approaches, particularly regarding cannabis, have been ineffective (Gayle, 2015), and have done little to limit the number of individuals consuming recreational drugs (Hickman et al., 2007), the case for treating recreational drug use as a health issue is strong (Csete et al., 2016). An alternative regulatory model utilising healthcare workers such as pharmacists, general practitioners (GPs) and mental health workers could perhaps more effectively minimise overall societal and health harms.

Prohibition of cannabis has had little positive impact on the physical and mental health of users (Kuepper et al., 2011; Moore et al., 2007) and in recent years synthetic cannabinoids have become more widely used which are significantly more dangerous than naturally occurring phytocannabinoids (Nia et al., 2016). Legalisation of cannabis in some US states has not led to a dramatic increase in the number of users (Hasin et al., 2015) or traffic accidents (Balko, 2015). The Colorado economy has benefitted since legalising cannabis for both therapeutic and recreational use with legal cannabis activities generating an estimated $2.39 billion in state output and 18,005 new jobs in 2015 (Light et al., 2016).

MDMA has been used as an adjunct to psychotherapy for decades and has been found, in clinical observation and case reports, to be effective in empathy training for couples experiencing interpersonal difficulties (Greer and Tolbert, 1986; Metzner, 2014; Shulgin and Shulgin, 1991; Stolaroff, 2004). MDMA is currently undergoing clinical trials for post-traumatic stress disorder therapy, in light of data strongly suggestive of therapeutic potential for the treatment of PTSD (Mithoefer et al., 2010, 2012), and anxiety in patients facing terminal illness (Nichols, 2014). MDMA could become an available therapeutic tool in the future and the NHS may need to adapt to integrate MDMA-assisted psychotherapy into the healthcare system.

The enhancement of interpersonal closeness and sociability has been attributed to MDMA's effectiveness as a therapeutic tool for psychotherapy (Mithoefer et al., 2010) and its continual popularity (Peters and Kok, 2009). MDMA continues to be a prevalent party drug (Reynolds, 1998; United Nations Office on Drugs and Crime, 2012) and there has recently been a rise in the usage of MDMA and other stimulants (Lader, 2015).

In contrast to alcohol (Abbey, 2002; Acierno et al., 1997; Boles and Miotto, 2003; Nutt et al., 2010; Public Health England, 2014; Taylor and Chermack, 1993) and more harmful stimulants such as cocaine (Banks et al., 2008), mephedrone (Jones et al., 2016) and novel

psychoactive substances (Westwell et al., 2013), MDMA reliably enhances empathy and prosocial behaviour (Bedi et al., 2010; Bershad et al., 2016; Hysek et al., 2013; Kamilar-Britt and Bedi, 2015; Wardle et al., 2014). Deaths from ecstasy are often due to more harmful compounds such as PMA (Byard et al., 1998). Poor quality and false MDMA is a predictable outcome of an unregulated black market industry. In other cases, users have simply taken far too much or otherwise used MDMA irresponsibly (Kalant, 2001).

Psilocybe mushrooms have been used in healing practices throughout history (Blinderman, 2016) and prehistory (Guerra-Doce, 2015). Although psilocybin is reportedly relatively safe (van Amsterdam et al., 2010), can lead to meaningful positive experiences (Carhart-Harris and Nutt, 2010) and is a potentially life improving compound (Griffiths et al., 2008), psilocybe mushrooms are currently class A drugs with up to seven years in prison for possession.

Psilocybin has been the subject of considerable research for the treatment of psychological conditions such as depression (Carhart-Harris et al., 2016), in palliative care (Griffiths et al., 2016; Grob et al., 2011; Kelmendi et al., 2016; Nichols, 2014; Ross et al., 2016) and for the treatment of alcohol and tobacco dependence (Bogenschutz et al., 2015; Garcia-Romeu et al., 2014; Johnson et al., 2014, 2017; Nichols, 2014). Recent studies have heralded the 'successful return of psychedelics to psychiatry' (Kleber, 2016) and new treatment alternatives to selective-serotonin reuptake inhibitors, SSRIs, are urgently needed for psychological conditions such as anxiety and existential distress in patients with life-threatening illness (Frazer and Benmansour, 2002; Lieberman and Shalev, 2016; McCorvy et al., 2016; Shelton and Hendricks, 2016; Spiegel, 2016).

The aims of the research were to assess how well the public's perception of the risks associated with the use of five well-studied substances of abuse corresponds to reported dangers posed by the substances. The research also sought to determine which types of vendor are most suitable for selling alcohol, tobacco, cannabis, MDMA and psilocybin according to a general population sample and to give an indication of whether or not the general population might support the substances being sold primarily in pharmacies for harm reduction purposes. The primary outlets for drugs are pharmacies, regulated shops and the black market, and these simple encompassing terms were used for the survey.

It was not hypothesised that pharmacies would be perceived to be the most suitable primary vendors of alcohol and tobacco, and these substances were included to ensure the study was a fair test. Mental health workers were included in the healthcare model as the therapeutic uses of MDMA and psilocybin require the presence of psychotherapists and

recreational drug use has been partly attributed to psychological and social factors (Hadaway et al., 1979).

A general population sample was used for this preliminary exploratory survey as changes in the regulatory environment of the substances discussed would be enacted due to changes in policy. Government policy is shaped by elected representatives and therefore the views of the general population. The study was designed with potential policy makers in mind so that an idea of the perceptions and views of the public in the UK can be determined and therefore help to guide policy.

Methods

This research obtained ethical approval from the Cardiff University School of Psychology ethics committee and was carried out with the informed consent of the participants.

Participant recruitment

Participants were recruited from the Qualtrics research panel, a volunteer panel that participate in online surveys. The link provided basic information about the study: 'This study concerns the relative perceptions and psychology of risk and risk management of specific drugs'. The aim was to select a general population sample of adults (see inclusion criteria) without requiring prior use of recreational drugs, knowledge of drug laws or background information about the topic.

Survey administration

The survey was designed to not be too intellectually challenging as the sample used was a general population sample. The scientific content was kept to a minimum to reduce the likelihood of problems with compliance and understanding of the data and information provided. Participants were required to complete the survey in one sitting. The survey was administered using Qualtrics, an online survey and data-collection software tool.

Participants were initially asked about perceptions of relative harm and were then presented information regarding reported relative harm and potential therapeutic applications before proceeding to answer questions pertinent to harm reduction. The contents of the data and information are viewable in the online Supplementary material.

Inclusion criteria

All participants were required to: consent to participating in the study; be UK nationals; aged 18 years or older.

Questions

The first question relevant to this report was designed to record participants' perceptions of relative harm and was answerable on a scale of 1–5. All following questions reported herein were answerable by a 1–10 scale. For each of the questions, respondents were asked to answer the question relative to alcohol, tobacco, cannabis, MDMA and magic mushrooms/psilocybin. The wording of the questions was kept as consistent and understandable as possible. Data from participants were not included, for questions about the practicality and relative support for being sold in pharmacies, if the participant did not answer the question, selected '1' for all options or selected 'don't know'.

Demographics

Participants provided basic demographic information regarding: age, education, gender and profession. Participants were also invited to include: 'other relevant personal information'.

Results

Survey completion

All 105 participants consented to taking part in the survey and completed it. Of these, six participants did not meet the inclusion criteria for the practicality question and two participants were not included for pharmacy support questions.

Participant characteristics

The demographics of the 105 participants are as follows: 53 males and 52 females; 20 participants aged 18–24, 22 aged 25–34, 21 aged 35–44, 21 aged 45–54 and 21 aged 55+; all UK nationals; 17 with GCSEs (General Certificate of Secondary Education) or equivalent, 23 with A-levels or equivalent, 5 with vocational training (e.g. apprenticeship), 47 with a bachelor's degree, 9 with a master's degree and 4 with a PhD.

Perceived harm

Question: 'Please give each of the five substances listed a number between 1 and 5 where (1) **is not at all harmful** to the consumer and to others and (5) **is very harmful** based on your understanding and experience. Please take addictive potential, typical regularity of consumption and long-term effects over an individual's lifetime into account' (Table 1).

Participants initially perceived the relative harm as follows: tobacco > MDMA > psilocybin > alcohol >

Table 1. Perceived harm scores (N = 105)

Substance	Mean	SD
Alcohol (e.g. beer/wine/vodka)	3.65	0.94
Tobacco (smoked)	4.45	0.82
Cannabis (herbal form vaporised/smoked/ingested)	3.29	1.12
MDMA (high purity pharmaceutical quality)	4.17	0.91
Psilocybin (when consumed as mushrooms)	3.73	1.08

Table 2. Most suitable vendor data (N = 105)

Substance and vendor	Mean	SD	Mode
Alcohol			
Pharmacy	5.32	3.02	1
Shop	6.94	2.66	10
Black market	3.91	3.14	1
Tobacco			
Pharmacy	5.54	3.00	1
Shop	6.42	2.88	10
Black market	3.74	3.05	1
Cannabis			
Pharmacy	6.74	2.93	10
Shop	5.06	3.22	1
Black market	3.63	3.06	1
MDMA			
Pharmacy	6.32	3.06	10
Shop	4.13	3.06	1
Black market	3.58	3.05	1
Psilocybin			
Pharmacy	5.89	3.17	1 + 10
Shop	4.17	3.07	1
Black market	3.57	3.13	1

cannabis (Table 1). An analysis of variance showed that there was a highly significant difference between drugs (F 4,416 = 28.9 p < 0.001). Planned comparisons showed that tobacco was rated as more harmful than the other drugs, and MDMA, psilocybin and alcohol more harmful than cannabis. The data suggest that the initial perceptions of the general population sample used do not correlate with the relative harm reported in the literature (Nutt et al., 2010). The initial perceptions of relative harm and therapeutic utility would likely heavily influence the participants' responses to many of the following questions. Therefore, the data in Table 1 justify the need to present the participants with contemporary information regarding relative harm and potential therapeutic applications. Relevant information was presented to the participants following recording data on perceived harm (see online Supplementary material) before further questions were asked.

Most suitable vendor

Question: 'From the point of view of **harm minimisation** to the individual consumer and to society as a whole which type of vendor is **most suited** to being **legally permitted to sell** the five substances discussed?' (Tables 2 and 3).

The available options were:

- Pharmacist with available NHS support from GPs and mental health workers;
- Shop that follows laws and regulations (e.g. supermarket);
- Unregulated black market street/online vendor.

The data (Table 2) suggest that pharmacies with available NHS support from GPs and mental health workers are *not* the most suitable vendors of alcohol or tobacco but are of cannabis, MDMA and psilocybe mushrooms. The participants may have reasoned for the purposes of reducing the harm that recreational use can cause and maximising the therapeutic utility of the substances. An analysis of variance

Table 3. Most suitable vendors of the five substances

Substance	Most suitable vendor
Alcohol	Shop
Tobacco	Shop
Cannabis	Pharmacy
MDMA	Pharmacy
Psilocybin	Pharmacy

showed that pharmacies were the preferred outlet (F 2,208 = 54.9 p < 0.001) and that ratings for cannabis and MDMA were higher than psilocybe mushrooms (F 4,416 = 8.0 p < 0.001). The opinion that pharmacies were the preferred outlet was stronger for MDMA than the other drugs (drug × outlet interaction: F 8,832 = 23.0 p < 0.001). The above results held up across gender and age. The pharmacy effect was significantly greater for those with University education.

Practicality of pharmacies as primary legal vendor

Question: 'Making **pharmacies** the primary **legal vendors** of the five substances discussed is **practical and realistic**' (Tables 4 and 5).

The data in Table 4 do not suggest that making pharmacies the primary vendors of alcohol and tobacco

Table 4. The practicality of pharmacies as primary vendors

Substance	Total score (N = 99)		University-educated score (N = 57)	
	Mean (SD)	Mode	Mean (SD)	Mode
Alcohol	4.92 (3.42)	1	5.12 (3.48)	1
Tobacco	5.15 (3.14)	1	5.61 (3.15)	1
Cannabis (therapeutic and recreational use)	6.90 (2.43)	5 + 10	7.54 (1.97)	9
MDMA (therapeutic and recreational use)	6.41 (2.90)	10	6.95 (2.71)	10
Psilocybin (therapeutic and recreational use)	6.01 (3.04)	10	6.63 (2.74)	10

Table 5. Likert-style results for practicality of pharmacies as primary vendors

| Substance	Total score
Alcohol	No
Tobacco	Neither agree nor disagree
Cannabis	Yes
MDMA	Yes
Psilocybin	Yes

is realistic. This result is especially clear when looking at the mode scores. The lowest standard deviation within the total sample and university-educated group for the practicality of making pharmacies the primary legal vendors of cannabis suggests the highest degree of confidence of all the five substances. Making pharmacies the primary legal vendors of cannabis, MDMA and psilocybe mushrooms for the purposes of harm reduction and maximising the therapeutic utility of the substances is realistic according to the participants.

Alcohol and tobacco in pharmacies

Questions were asked to determine whether making pharmacies the primary legal vendors of alcohol and tobacco would be a positive change that the participants would support. However, as data in Tables 2 and 4 suggest that this is not realistic and that regulated shops are the most suitable legal vendor, the data obtained are not discussed in detail. Data from these questions can be seen in Tables 9 and 10, Figure 7 and in the online Supplementary material.

Cannabis in pharmacies

Question: 'If **cannabis** were to be legalised for medicinal and recreational use and sold in pharmacies with available NHS support from GPs and mental health workers, as **1**. A safer recreational drug alternative to alcohol and tobacco **2**. A source of therapeutic compounds (such as THC, CBD and other cannabinoids)
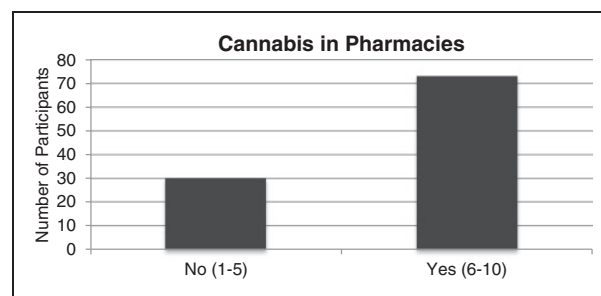
Figure 1. Relative support for cannabis to be legally available in pharmacies. Number of participants who selected 'No' (1–5) vs. 'Yes' (6–10).
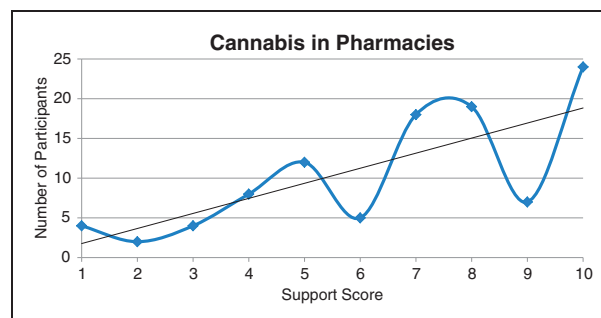
Figure 2. Relative support for cannabis to be legally available in pharmacies. Number of participants who selected the specific support score (1–10).

and **3**. So pharmacists can give advice and guidance on safe usage practices, this would be a *positive* change that you would support' (Figures 1 and 2; Table 6).

Of the five substances discussed in this study, cannabis is the substance which received the highest level of support to be sold in pharmacies as evidenced by the highest support score of 7.02 from the total sample. Fifty-seven percent of the total 45 non-university-educated participants chose 6 or above for cannabis being available in pharmacies as did 81% of the total 60 university-educated participants. Unlike with the other substances, there was no significant resistance to

Table 6. Relative support for cannabis to be legally available in pharmacies

Education	Mean (SD)	Mode	N
All participants	7.02 (2.52)	10	103
Non-university educated	6.30 (2.69)	5	44
University educated	7.56 (2.25)	10	59

Tabulated data compared across the total sample and educational level (university educated and non-university educated).
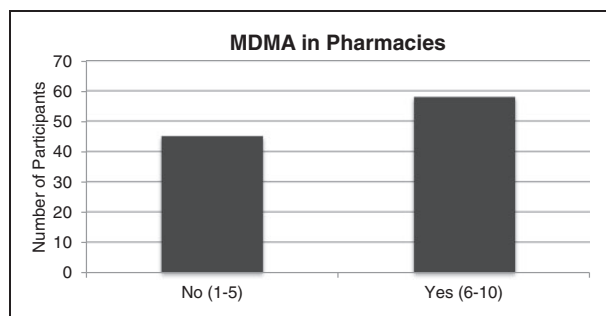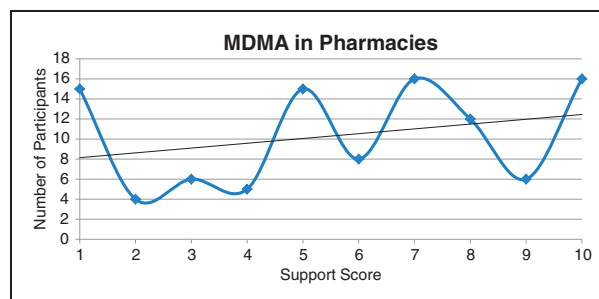

Figure 3. Relative support for MDMA to be legally available in pharmacies. Number of participants who selected 'No' (1–5) vs. 'Yes' (6–10).

Figure 4. Relative support for MDMA to be legally available in pharmacies. Number of participants who selected the specific support score (1–10).

Table 7. Relative support for MDMA to be legally available in pharmacies

Education	Mean (SD)	Mode	N
All participants	5.88 (2.97)	7 + 10	103
Non-university educated	5.00 (2.94)	5	44
University educated	6.54 (2.84)	7 + 10	59

Tabulated data compared across the total sample and educational level (university educated and non-university educated).

cannabis being available in pharmacies as evidenced by the low number of 30 (out of 105) participants choosing 1–5. A majority of both the non-university-educated and university-educated participants support the proposed change in policy.

MDMA in pharmacies

Question: 'If **MDMA** were to be legalised for therapeutic and recreational use and sold in pharmacies with available NHS support from GPs and mental health workers, as **1**. A safer recreational drug alternative to alcohol and tobacco **2**. A rational evidence-based solution to the ongoing problem of unregulated party drugs such as mephedrone **3**. A potential therapeutic tool for psychotherapy and **4**. So pharmacists can give advice and guidance on safe usage practices, this would be a *positive* change that you would support' (Figures 3 and 4; Table 7).

The results for selling MDMA in pharmacies demonstrate a greater level of support amongst the university-educated participants than the non-university-educated participants. Thirty-nine percent of the total 45 non-university-educated participants and 69% of the total 60 university-educated participants chose 6 or above for MDMA being available in pharmacies. If the results (Table 7) are converted to a Likert-style scale, the non-university-educated participants neither

agree nor disagree to MDMA being available in pharmacies whereas the university-educated participants agree.

Psilocybe mushrooms in pharmacies

Question: 'If **magic mushrooms** were to be legalised for therapeutic and recreational use and sold in pharmacies with available NHS support from GPs and mental health workers, as **1**. A safer recreational drug alternative to alcohol and tobacco **2**. A potential therapeutic tool for psychotherapy and **3**. So pharmacists can give advice and guidance on safe usage practices, this would be a *positive* change that you would support' (Figures 5 and 6; Table 8).

The university-educated group mean support score of 6.5 for psilocybin in pharmacies is equal to MDMA (Tables 7 and 8). Forty-eight percent of the total 45 non-university-educated participants chose 6 or above for psilocybin being available in pharmacies as did 69% of the total 60 university-educated participants. If the data are converted to a Likert-style scale, the non-university-educated group neither agree nor disagree whereas the university-educated group agree.

Further analysis

The data were searched for individuals whose profession or other personal details are relevant to the study.
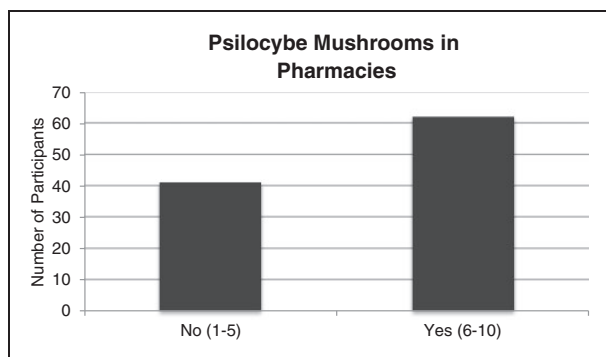
Figure 5. Relative support for psilocybin to be legally available in pharmacies. Number of participants who selected 'No' (1–5) vs. 'Yes' (6–10).
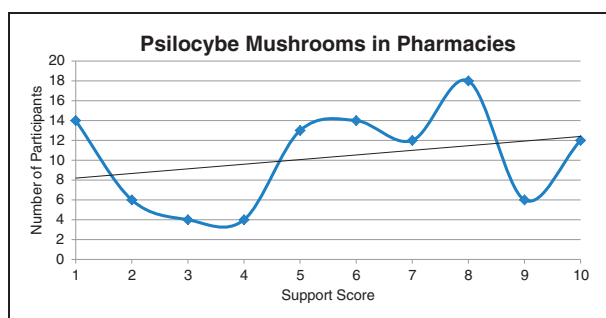
Figure 6. Relative support for psilocybin to be legally available in pharmacies. Number of participants who selected the specific support score (1–10).

Table 8. Relative support for psilocybin to be legally available in pharmacies

Education	Mean (SD)	Mode	N
All participants	5.87 (2.87)	8	103
Non-university educated	5.07 (3.14)	1	44
University educated	6.47 (2.51)	8	59

Tabulated data compared across the total sample and educational level (university educated and non-university educated).

Police, drug users, healthcare workers, patients and drug dealers are demographics that would arguably be affected by changes in the regulatory environment of the substances discussed. The pharmacy support scores for relevant individuals can be seen in Tables 9 and 10 and Figure 7.

Discussion

According to the participants making pharmacies the primary legal vendors of alcohol and tobacco is not

Table 9. Medical practitioner support scores for pharmacies as legal vendors

Participant	Alcohol	Tobacco	Cannabis	MDMA	Psilocybin
Carer (rehabilitation)	3	8	10	10	10
Nurse (a)	1	9	10	3	6
Nurse (b)	1	1	10	7	8
Staff nurse	6	5	10	10	5
Counsellor	6	8	10	10	9
Physiotherapist	6	6	8	9	6
Mean	3.8	6.2	9.7	8.2	7.3

Table 10. Other relevant participant support scores for pharmacies as legal vendors

Participant	Alcohol	Tobacco	Cannabis	MDMA	Psilocybin
Drug user	6	7	8	7	7
'Dealer'	10	10	10	8	6
MS sufferer	2	1	8	9	2
Police officer	7	3	8	5	7
Healthcare (manager)	10	10	7	8	8
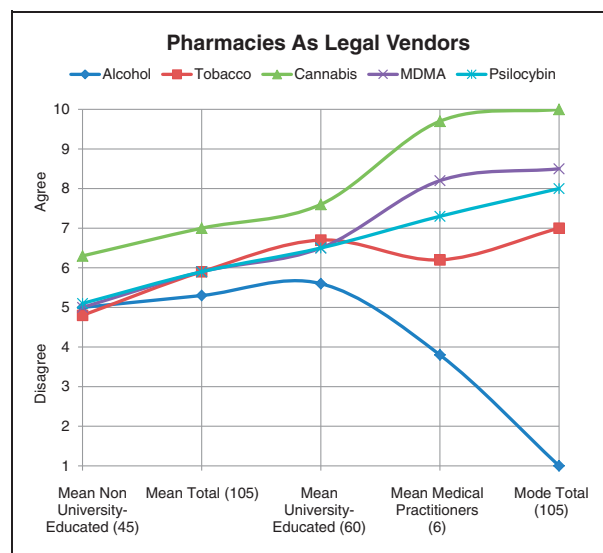
Figure 7. Support scores for pharmacies as legal vendors of the five substances. The mode score for MDMA is represented as the average of the two mode scores.

realistic (Table 4), and regulated shops are more suitable legal vendors (Table 2). The existence of bars, off-licences, supermarkets, restaurants and other stores that sell alcohol as a drink and storage capacities of

existing pharmacies may have influenced the participants. Tobacco's highly addictive nature means that consumers need to be able to access it during most of the 24 hours in a day (Benowitz, 2010). There may have been a perception that not all smokers can easily obtain their highly addictive drug in pharmacies due to geographical availability and opening times. Additionally, there may have been an ideology-driven perception that, as tobacco and alcohol have no accepted or potential therapeutic applications, they should not be sold in pharmacies.

The data from the general population sample used suggest that selling the currently illicit substances in pharmacies is realistic and that pharmacies are the most suitable legal vendor. Amsterdam style coffee shops, implied by the regulated shop option, and other forms of shop were not the favoured choice of the participants. This may be due to the participants perceiving that pharmacists are better qualified to dispense cannabis, MDMA and psilocybin than people with a non-medical background working in a shop.

In some countries, such as in some states in the United States, people can access medical marijuana. Applying a similar model to the UK would likely mean that patients could obtain medicinal cannabis in pharmacies with a prescription. However, prescription access only cannabis would not mitigate the existence of the black market for non-medical use nor would it help users of cannabis who, without a legal medical regulatory framework (Lamb et al., 2016), may have an increased likelihood of developing psychological, interpersonal or professional problems due to their recreational use of cannabis (Nutt et al., 2010).

Cannabis is used to treat a broad range of different medical and psychiatric conditions including carcinoma, arthritis, glaucoma, stress, anxiety, depression, anger, insomnia, chronic pain, epilepsy and neurodegenerative diseases (Amar, 2006; Compston and Coles, 2002, 2008; Grotenhermen and Muller-Vahl, 2012; Hirst et al., 1998; Kumar et al., 2001; Reinarman et al., 2011; Ware et al., 2004). It is therefore not without precedent that the medical practitioners (Table 9) and the multiple sclerosis sufferer located in the sample (Table 10) were supportive of cannabis being legally available in pharmacies. Participants were also perhaps pragmatic towards the need for cannabis to be regulated as prohibition of cannabis has been particularly ineffective (Werb et al., 2013).

Making pharmacies the primary legal vendors of cannabis for therapeutic and recreational use is realistic according to the participants (Table 4). Consequently, a screening or a consultation between potential cannabis users and GPs is perhaps achievable. Due to cannabis' relatively high safety profile (Taylor et al., 2012;

Zajicek et al., 2005), it is probable that only a minority of the general population would not receive consent to use cannabis sold in a healthcare setting after a consultation with their GP.

The precise roles of GPs, pharmacists and mental health workers in such a modified regulatory environment are undetermined. Two access routes to cannabis could possibly be available: (1) Cannabis with a prescription and (2) Harm minimisation intervention in which pharmacists maximise the therapeutic utility of cannabis.

Pharmacies can be strictly regulated, and pharmacists can adhere to a strict code of ethical conduct (Resnik et al., 2000). If dispensing for non-medical use, pharmacists could recommend strains with lower overall concentrations of THC and higher proportion CBD than modern black market cannabis (Russo, 2011; Schubart et al., 2011). Pharmacists could also provide harm reduction advice such as not to smoke cannabis mixed with tobacco (Aldington et al., 2007; Lachenmeier and Rehm, 2015; Ribeiro and Ind, 2016; Tashkin, 2012) and that using a vaporiser is likely less harmful than smoking (Cozzi, 1993; Gieringer et al., 2004). Alternatively, pharmacists could recommend ingestion of cannabis which mitigates the potential dangers of smoking; however, they would also need to convey the unique risks of ingestion, such as stronger potential effects, as drug strength is less easily titrated in real-time compared to other methods of administration.

Research has suggested that chronic daily use of cannabis is associated with increased likelihood of developing psychosis (Brañas et al., 2016) and by being the primary legal vendors of cannabis, pharmacists would be in a position to stress that infrequent use of cannabis presents significantly less risk than heavy use. High-risk individuals such as people with a family history of mental illness may be at a lower risk of developing cannabis-related mental health problems if cannabis is primarily available in a healthcare setting in which trained medical practitioners can offer practical advice and guidance.

Although MDMA is a comparatively safe stimulant, referred to both as an entactogen and empathogen, with the potential to give users deeply meaningful and positive experiences (Baggott et al., 2016; Bedi et al., 2014; Bershad et al., 2016; Kirkpatrick et al., 2012; Schmid et al., 2014, 2015; Wardle and de Wit, 2012), it can cause considerable harm and death to users. As the participants concluded that making pharmacies the primary legal vendors of MDMA is practical and realistic, a mandatory GP consultation and screening of potential MDMA users is feasible. Doctors and pharmacists working in combination could act to educate MDMA users on safe usage practices and minimise

the risk posed to individuals (Becker and Hu, 2008; Global Drugs Survey, 2016).

MDMA cannot be used with the same frequency as alcohol, and chronic daily use can lead to severe mental health problems (McGuire et al., 1994). However, MDMA has lower addiction potential than other stimulants such as cocaine or methamphetamine, and regular chronic use is rare (Solowij et al., 1992). If MDMA were only legally available in pharmacies, then pharmacists would be able to stress that infrequent moderate usage of MDMA poses significantly less risk (Laursen et al., 2016).

Typically for a drug to reach market, it needs to be approved by the FDA in the US and the EMA in Europe, but this route only applies to medicines. Any change in substance abuse management is determined by policy. The participants in this study concluded that in order to reduce recreational drug harms, MDMA could be available in a healthcare context. The data in Figures 3 and 4 and Table 7 are suggestive that the general population on the whole would not oppose MDMA being available in pharmacies when presented with information regarding therapeutic uses and relative harm. Six healthcare practitioners located within the sample had a mean MDMA support score of 8.2 (Table 9) suggesting that those healthcare workers were supportive of MDMA being available in a healthcare setting.

While empirically psilocybe mushrooms are one of the safest recreational drugs known, due to extremely rare mortality (Ghodse et al., 2013; Lader, 2015), uncontrolled recreational use of psilocybe mushrooms would pose a considerable risk to the mental health of vulnerable individuals (Barrett et al., 2016). Unquestioning acceptance of the therapeutic value of hallucinogens such as LSD has historically proven to be dangerous, and the medical profession has an obligation to ensure that the questionable 'Turn on, tune in, drop out' message of Timothy Leary in the late 1960s is not repeated (Goodwin, 2016). As with treating patients for psycho-existential distress (Blinderman, 2016), medical practitioners would have an obligation to reduce the likelihood of adverse reactions to psilocybin.

Making pharmacies the primary legal vendors of psilocybe mushrooms is practical and realistic (Table 4). GPs would therefore be able to consult with and screen potential psilocybe mushroom users. Screening of potential users of psilocybin is essential as the hallucinogen can induce acute and, albeit rarely, persistent adverse psychological reactions (Johnson et al., 2008). However, many challenging experiences or 'bad trips' upon later reflection are perceived to have been beneficial (Carbonaro et al., 2016).

As psilocybe mushrooms cause little damage to societal and personal wellbeing and may have a net positive effect (Carhart-Harris and Nutt, 2010, 2013) any psilocybe mushroom service need not necessarily be viewed as being for the purposes of reducing the harms caused by psilocybe mushrooms. Any non-prescription service provided by pharmacists and therapists should aim to maximise the therapeutic utility of psilocybin. Any non-prescription psilocybin intervention could therefore perhaps be termed a positive psychology intervention (Shelton and Hendricks, 2016). A positive psychology intervention with approval from a GP, pharmacist and therapist could be an uplifting alternative to other non-essential or non-therapeutic uses of psychoactive substances (Hendricks et al., 2015).

A psilocybin study for severely depressed and anxious patients with life-threatening cancer was conducted in 'an aesthetic living-room-like environment with two monitors present' (Griffiths et al., 2016). A mode of administration protocol would need to be developed (Breckenridge and Grobbee, 2016) as currently there is no precedent in the healthcare delivery model for the types of protocols that are followed in psilocybin-assisted psychotherapy. Specially trained healthcare professionals are required and they need to be present throughout the psilocybin experience (Johnson et al., 2008). Pharmacies with specialised rooms and on-site psychotherapists may, therefore, be a potential location for psilocybin interventions.

Considering psilocybin's putative role as a meaning response enhancer would likely be an essential integral part of any psilocybin intervention. Preparation, music, plants, pictures and the attitudes of individuals involved in the set and setting of the experience are all key extra-pharmacological components. Improved therapeutic outcomes of psilocybin experiences are probable if medical professionals with a positive attitude have administered the experience as opposed to a black market distributor or staff in a regulated shop (Carhart-Harris et al., 2016; Hartogsohn, 2016). Facilitating mystical experiences would likely also be an integral part in any psilocybin intervention as subjects' mystical experiences are reported as being highly correlated with therapeutic outcomes and beneficial long-term effects (Garcia-Romeu et al., 2014; Griffiths et al., 2016; Kelmendi et al., 2016; MacLean et al., 2011; Ross et al., 2016; Summergrad, 2016).

To conclude, the study described herein used all UK participants, UK-specific data and information and asked questions directly relating to the UK National Health Service. The data collected are therefore not applicable to other countries with different population demographics, healthcare systems and recreational drug problems. Such drawbacks limit the generalisability of the results of this study to other countries.

Although the sample size was relatively small (105), the study utilised an unbiased recruitment strategy. Other studies with recruitment strategies that include advertising on websites frequented by recreational drug users limit their objective reliability, whereas the participants in this study were not recruited due to any pre-existing interest in recreational drugs. Further research using a larger specialist healthcare sample would be useful in determining whether a significant difference between the general population and health-care practitioners does exist or whether the data obtained from the six healthcare workers in this sample (Table 9) are simply attributable to the cluster-ing illusion.

Overall, the data suggest that changes in the legal status or the implementation of harm reduction strate-gies, with regard to cannabis, MDMA and psilocybin being sold in pharmacies, would likely not be associated with significant resistance from the public in the UK. However, this finding should be interpreted with great care and caution as public support for harm reduc-tion strategies does not necessarily suggest that harm reduction strategies are warranted. Whether such changes should actually be made and the public health impacts of such changes cannot be determined from the current study. Cannabis, MDMA and psilo-cybin remain controlled drugs in many countries, including the UK, severely restricting possession and supply. Changes to the status of these substances, so that they can be made available and managed through licensed outlets such as pharmacies, will require legis-lative change promoted by clear evidence of therapeutic benefit.

In summary, the data suggest that the general popu-lation are supportive of currently criminalised com-pounds with potential therapeutic applications being utilised in treatments. Schedule changes of phytocanna-binoids, MDMA and psilocybin from schedule 1 are needed to achieve this. The results of this study are supportive of the hypothesis that the general popula-tion in the United Kingdom are comfortable treating recreational drug use as health issue with GPs, mental health workers and pharmacists playing roles.

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