

Surveying Over the Counter and Prescription Only Medication Misuse in Treatment Services During COVID-19

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ABSTRACT

BACKGROUND: A greater understanding of Over the Counter (OTC) and Prescription Only Medication (POM) misuse amongst adults accessing substance misuse services (SMS) during COVID-19 is required to identify how SMS can better meet the needs of the people who require treatment.

AIM: To use a questionnaire to explore OTC/POM misuse during COVID-19 in adults accessing community SMS in England.

METHODS: In 2020 to 2021 anonymous self-administered online/paper questionnaires which collated quantitative and qualitative data were completed. They were piloted for suitability and ethical approval was obtained. Thematic analysis was conducted for qualitative data and chi-square tests used to assess the relationship between quantitative variables.

RESULTS: Participants were Caucasian (94.6% British), majority male (58.9%), aged 18 to 61 years. Most were prescribed medication for problematic substance use, with a 92.5% self-reported adherence rate. The misuse of benzodiazepines (22.2%) codeine products (30.8%) and pregabalin (14.5%) predominated and 37.5% misused 2 or more medicines. Administration was usually oral and concomitant use of other substances was common: alcohol 44.6% (52% daily), tobacco/vaping 73.2% and illicit substances 58.9%. There were statistically significant associations identified, including between changes during COVID-19 to OTC/POM misuse and illicit use. Only 56 questionnaires were included in the analysis: we believe this low number was because of infection control measures, limited footfall in services, pressures on staff limiting their capacity to distribute the paper questionnaires and reliance upon telephone consultations limiting online distribution. Increasing OTC/POM misuse and obtaining illicit supplies were reported when access to usual supplies were restricted; however, changes to doses/dispensing arrangement liberalisation in response to COVID-19 were positively viewed.

CONCLUSION: OTC/POM misuse, including polypharmacy and concomitant use of other substances occurred during COVID-19: SMS need to be vigilant for these issues and mitigate the associated risks for example with harm reduction interventions. Further qualitative research is required to explore the issues identified.

KEYWORDS: COVID-19, over the counter drug misuse, prescription drug misuse, questionnaires and surveys

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Introduction

The impact of OTC/POM misuse

Over the counter (OTC) and prescription only medication (POM) misuse can be defined in a variety of ways: in this case, it is where the medication is intentionally used for non-medical purposes in a way not intended by a clinician or the manufacturers.¹⁻³ The underlying causes for misuse are wide-ranging and can include self-medicating for trauma (including adverse childhood experiences), mental and physical health conditions, to potentiate or otherwise manage side-effects (including withdrawal symptoms) of other substances and for experimentation and to induce pleasurable effects.⁴⁻⁶ The misuse of OTCs and POMs can have notable consequences on

physiological, psychological and socio-economic wellbeing, and the risk of harms increase when taken in combination, and alongside illicit substances and alcohol.⁷⁻¹²

OTC/POM misuse in England

Concerns about OTC/POM misuse remains ongoing, and although actual prevalence is not known, it continues to feature in drug related deaths.^{13,14} It is also associated with reduced quality of life, a greater burden of psychiatric diagnosis and co-prescribing of psychotropic medication, functional problems of greater severity and increased rate of high-risk behaviours including polysubstance use.¹⁵⁻¹⁷ The 2022 YouGov Big Survey on Drugs¹⁸ suggested that 9% of people know someone who



has a serious problem with POM and it is perhaps these individuals who are more likely to require treatment from specialist substance misuse services (SMS). SMS data is unfortunately limited since only up to 3 substances that an individual uses is formally reported: national data indicates that 52% use opiates, but it is not possible to determine if this relates to illicit opiates such as heroin, or OTC/POM products such as methadone, morphine or codeine.^{19,20}

OTC/POMs may be sourced illicitly, through unregulated online sales, diverted supplies or street dealers, or via legal sales or prescription supplies.^{9,21} Public Health England (PHE) (now known as the Office for Health Improvement and Disparities) published the results of their landmark review, which found that 1 in 4 English adults in primary care were being prescribed medication which may be associated with dependence or withdrawal symptoms, with the greatest prevalence amongst older adults and those living in areas of greater deprivation.^{22,23} Most recently, in 2021 the national overprescribing review report from the Department of Health and Social Care (DHSC) stated that *'almost two in three people who are taking eight or more medicines are on at least one drug that may cause dependency'*.²⁴ Furthermore, Davies et al highlighted that unnecessary NHS England prescribing of medicines associated with dependency costs on average between £455 887 035 and £518 411 542 annually.²⁵

The impact of COVID-19

The published evidence base associated with SMS during the Coronavirus pandemic (COVID-19) is still emerging; however, community pharmacy and SMS provision, and the consequent care individuals received has been severely affected.^{26,27} COVID-19 also impacted upon the ability to obtain OTC/POMs: there have been reports of changes relating to product availability, price and quality in the illicit drug market too.²⁸⁻³⁰ Individuals who use substances are also at greater risk of relapse or withdrawal during COVID-19,³¹ because of isolation, boredom, increased anxiety, interpersonal violence, job loss or the inability to finance drug use through begging or sex working.^{32,33}

In England, national guidance and professional bodies supported increased supplies of 'take home'/reduced supervised consumption ('liberalisation') of opioid substitute medication prescribed by SMS and changes to service delivery for people who use substances.³⁴⁻³⁵ Concerningly, preliminary data from PHE's Drug Harms Assessment and Response Team suggests that deaths in SMSs for primary opiate use have increased, though not as a direct result of contracting COVID-19.³⁶ The impact upon people who misuse OTC/POM remains unclear; therefore, this research aims to contribute to the evidence base by creating an increased understanding of consumption during COVID-19.

Research rationale

There is a paucity of published data regarding OTC/POM misuse amongst people currently accessing SMS, and there is a need for more UK research. With growing media attention particularly because of increasing drug related deaths,³ SMS commissioners and the public are demonstrating an active and increased interest in the misuse of OTC/POMs. SMS providers have a significant role in managing POM and OTC misuse, especially when this becomes problematic or impacts on their other substance use issues. Therefore, SMSs need to adapt to meet the growing demand from people misusing OTC/POM and any associated impact of COVID-19. An improved understanding is important, since effective SMS interventions need to be tailored to the individuals requiring them and there remains a lack of national guidelines that are specific to OTC/POM management in SMS.^{37,38} Consequently, with improved knowledge of current OTC/POM misuse within SMS, this can facilitate such services to develop the quality of care delivery and hopefully enable improvements in associated morbidity and mortality to be achieved. Furthermore, people who do engage with treatment tend to have relatively high rates of retention, completion and abstinence (from illicit use and OTC/POM misuse),^{39,40} and as previously outlined, the associated impact of COVID-19 additionally requires further exploration.

Aim and objectives

The aim is to explore OTC/POM misuse amongst adults accessing community SMS in England during COVID-19. The objectives are to use a questionnaire to identify the types of medication, use of other substances and associated demographic characteristics.

Methods

Selected methodology

An anonymous self-reported questionnaire was chosen to explore OTC/POM misuse because they have high rates of completion.⁴¹ They avoid interviewer bias and risk of coercion and are relatively inexpensive and easy to administer. A scoping review failed to identify a suitable questionnaire or any standardised scales, therefore the researcher developed a novel questionnaire (see Supplemental File) which was piloted using questions based upon findings from a recent systematic review.⁴²

Questionnaire design

The mixed methods questionnaire will aim to obtain quantitative and qualitative data from people who have misused OTC/POM in the preceding month, based on a timescale used by the

government's National Drug Treatment Monitoring System (NDTMS).²⁰ The data to be collected will include:

- Basic demographic details including age, gender, ethnicity and associated SMS name.
- Details of any medication currently prescribed for dependency, the use of other substances (alcohol, tobacco, vape/e-cigarettes and traditional illicit substances), OTC/POM being misused and changes during COVID-19.

Piloting the questionnaire

Stakeholder review and piloting helps to ensure that the questions cover all the relevant issues since the questionnaire must be comprehensive, specific to the respondent group and exclude any irrelevant items.⁴³⁻⁴⁵ Three individuals with lived experience and at different stages of recovery formally reviewed and piloted the questionnaires. Furthermore, to ensure question suitability and layout, SMS staff and service user representatives informally reviewed the questionnaire.

Stakeholders were consulted until the final questions were drafted ready for piloting. Consequent improvements included pinpointing where poor responses occurred and a reflection upon how to improve upon this, to help ensure that the views of 'hard to reach' groups would be captured.⁴⁶ One such example is that for the online version, 'prefer not to state' has been added for ethnicity following strong feedback from an individual who did not want to provide their ethnicity. When piloting, it took respondents about 10 minutes to complete either the online or paper version.

Inclusion criteria

- Adult aged over 18 years.
- Capacity to consent.
- Receiving community treatment for substance use from Humankind (one of the UK's largest national third sector specialist SMS providers) or Exeter Drugs Project (EDP), its wholly owned subsidiary.⁴⁷
- Misused OTC/POM (for intentional non-medical purposes in a way not intended by a clinician or the manufacturer) that is not prescribed for substance use disorder within the last month.

Exclusion criteria

Non-English speaker or where additional needs (eg, lack of timely interpreter availability) could not be met by the SMS.

Data collection

Data collection occurred during the COVID-19 pandemic, collected from August 2020 to August 2021. There are no known published studies to guide recruitment numbers, though the larger the response rate the more generalisable the findings may be and for qualitative data, enough data should be captured until data saturation is thought to have been achieved.⁴⁸ All eligible individuals who have contact with the service

during the study period are invited to participate should enable a range of relevant views to be obtained.^{43,49} Paper and online versions will be distributed via service-user facing staff (after receiving guidance on how to facilitate this by the lead researcher) when the individuals contact the SMS.

Ethical considerations

The questionnaire methodology was reviewed and approved by Humankind, EDP and Aston University's Life and Health Sciences Ethics Committees (ID#1655). Consent is presumed since individuals' self-consent by opting to complete them: their anonymised, voluntary involvement and the lack of impact on their care regardless of their decision to participate is made explicit. No incentives were provided for individuals to participate.

Analysis

Paper and online questionnaire results were captured in an Excel spreadsheet and the quantitative data analysed with IBM® Statistical Package for the Social Sciences statistics software version 26 (SPSS®) using Pearson chi-square (for categorical variables) and *t*-test (for continuous variables) to assist in identification of any association between all of the different variables, such as the type of OTC/POM being misused and demographic characteristics.⁵⁰ Content analysis (the process of applying a standardised coding frame to free-format responses to consistently classify them into meaningful categories and facilitate analyses) was used for the associated qualitative data.⁵¹ All researchers are suitably experienced in qualitative analyses: one researcher (RG) coded the data, which was verified (by IM) and a third researcher was available to resolve any disagreements.

Results

A total of 80 questionnaires were received (15 online: 65 paper), though after preliminary screening, questionnaires were eliminated if they did not meet the inclusion criteria: 12 were from prison SMS and 12 did not capture OTC/POM misuse in the last month. Fifty-six questionnaires were included in the analyses and all answers were included; however, where answers were not given (ie, left blank), these were captured as 'not stated' to ensure completeness of the dataset.

Demographic characteristics

Demographic characteristics of respondents are outlined in Table 1: all self-identified as Caucasian (94.6% British), aged between 18 and 61 years. The majority identified as male (58.9%) and accessed the Staffordshire Treatment and Recovery Service (STARS) service (56.6%).

OTC/POM misuse

In the preceding month 21 (37.5%) reported misusing more than 1 OTC/POM and 48% were legally sourced (ie, bought OTC/via prescription intended for their personal use). As outlined in Table 2, 79.5% were taken orally and the misuse of

Table 1. Summary of age, ethnicity and gender data for questionnaire respondents.

		GENDER		TOTAL
		FEMALE	MALE	
Number of respondents		23 (41.1%)	33 (58.9%)	56
Mean age and range (years)		38 (22-61)	40 (18-61)	39 (18-61)
Ethnicity	White – British	20 (35.7%)	33 (58.9%)	53 (94.6%)
	White – Irish	2 (3.6%)	0 (0.0%)	2 (3.6%)
	White – Other	1 (1.8%)	0 (0.0%)	1 (1.8%)

benzodiazepines (22.2%) codeine products (30.8%) and pregabalin (14.5%) predominated. All individuals who misused gabapentin also misused pregabalin and accessed the STARS service.

Ease of availability contributed to misuse, and sources included the internet, over the counter from pharmacies, on prescription, via street dealers and friends:

#06: *“How easy it is to get hold of it – in the past I have found it so easy and told different stories to access codeine liquid and tablets”.*

#09: *“It’s easy to pick up diazepam and pregabalin. . .Buying through someone I know who is prescribed it”*

#14: *“I buy subbies [oral buprenorphine] from dealers”.*

Manual content analysis of qualitative data identified similar themes for changes in use of illicit substances and OTC/POM misuse during COVID-19.

Increases were predominantly to manage ‘COVID-related’ issues such as stress, boredom, loneliness, mental health symptoms and because of traumatic life events/experiences that occurred/worsened due to COVID-19 for example, job loss, interpersonal domestic violence, bereavement, sex working). Consequently, reductions were reported when lockdowns eased (eg, returned to work/college).

#11: *“increased [codeine combination products] but reduced when lockdown eased so using a bit less but still more than before lockdown”*

#38 *“Using more. . .boredom, need to forget problems”*

#25: *“Trying to escape domestic violence emotional effects”*

COVID-19 related changes were also observed due to alterations in access/money to afford supplies/opportunity to use or when switching between different substances/to manage withdrawal symptoms

#04: *“not going out as much”*

#31: *“started [synthetic cannabinoids] as more accessible and cheaper than heroin. . .Buy whatever methadone I can buy if I come off script”*

#37: *“increased [cannabis] as stopping diazepam”*

Use of other substances

Thirty-three (58.9%) used illicit substances in addition to misusing OTC/POM: 51.5% used daily, which may be indicative of dependent use, and 59.3% of these illicit substances (predominantly cannabis) were smoked. The only ‘other’ substance stated was ‘monkey dust’: a novel psychoactive substance, and this was only reported by individuals accessing STARS SMS. Of those who used illicit substances, 10 (30.3%) reported changes to their illicit use during COVID-19; only 2 reported their use reduced.

In the preceding month 25 (44.6%) used alcohol (52% drank daily, including up to an estimated 788 units/week for 1 individual) and 41 (73.2%) used tobacco/vaped (all used daily, up to 45 times a day). Of those that used alcohol, 14 (56%) [2 (8%) not stated] reported confirmed changes in their alcohol consumption during COVID-19: 12 (85.7%) of them increased their use. Of those who smoked tobacco/vaped, 20 (48.8%) respondents reported changes in their use of tobacco/vaping: all increased their use.

Concomitant prescribed interventions

Forty respondents (71.4%) were in receipt of prescribed interventions for SMS. A summary of the medication being prescribed, with adjunctive use of other substances is provided in Table 3. All prescribed interventions were oral formulations. Three people (all prescribed methadone) reported using their medication differently to how the prescriber intended, giving an adherence rate of 92.5%. Where taken differently, the rationale provided was that they preferred to split their dose throughout the day, saved up supplies for when they needed it or to deliberately misuse by taking excessive quantities.

Fourteen (35%) of those who were prescribed pharmacological interventions experienced prescription changes during COVID-19: they were either prescribed medication for relapse prevention or opioid substitute treatment (OST) (9 were on methadone oral solution). The qualitative analysis identified that the predominant rationale for changes were in response to dynamic risk assessment and mitigation strategies relating to pharmacy provision, drug testing, dose

Table 2. Summary of different OTC/POMs and routes of administration used by respondents in the preceding month.

ROUTE OF ADMINISTRATION		ORAL	INJECT	SNORT	NOT STATED	TOTAL		
OTC/POM reported as being misused	Antidepressants	Amitriptyline	1	0	0	1	2 (1.7%)	
		Mirtazapine	3	0	0	0	3 (2.6%)	
	Anabolic steroids (eg, testosterone)		1	0	0	0	1 (0.9%)	
	Antihistamine		3	0	0	0	3 (2.6%)	
	Baclofen		1	0	0	0	1 (0.9%)	
	Hypnotics	Benzodiazepines	26	0	0	0	26 (22.2%)	
		Zopiclone	6	0	0	1	7 (6.0%)	
	Gabapentinoids	Gabapentin	3	1	0	1	5 (4.3%)	
		Pregabalin	14	0	0	3	17 (14.5%)	
	Opioids	Buprenorphine	2	0	0	0	2 (1.7%)	
		Codeine	Non-combination product	9	0	0	7	16 (13.7%)
			Combination product	13	0	0	7	20 (17.1%)
		Fentanyl	0	1	0	0	1 (0.9%)	
		Dihydrocodeine	1	0	0	0	1 (0.9%)	
		Methadone	4	0	0	0	4 (3.4%)	
		Morphine	1	1	0	0	2 (1.7%)	
		Tramadol	3	0	1	0	4 (3.4%)	
	Quetiapine		2	0	0	0	2 (1.7%)	
	Total		93 (79.5%)	3 (2.6%)	1 (0.9%)	20 (17.1%)	117	

optimisation and liberalisation which were overwhelmingly positively regarded:

#04: "Change has helped stop illicit heroin and crack, also reduced alcohol"

#05: "Reduce pick up better, less hassle"

#07: "Was changed to once every 2 weeks at first but now back to once a week. I was happy for the support in keeping me safe".

#18: "Much better this way as not going to the chemist every day. OK with storing safely".

#28: "Dose changed as sex working has been busier during covid".

#33: "Pick up changed to weekly due to impact on the chemist. More drug screens"

#42 "Like these changes. Less likely to use drugs as had methadone on waking".

Association between categories

A low probability (P) value of $<.005$ was selected given the relatively small sample size, to provide greater assurance of

statistical significance of the findings⁵⁰ and the statistically significant findings are summarised in Table 4. A statistically significant association was found between changes in OTC/POM misuse and illicit substance use during COVID-19 [χ^2 (2, $n=56$)=18.07, $P=.000$]. There was a significant relationship between the person attending the STARS service and their misuse of codeine only (all product types) [χ^2 (1, $n=56$)=10.85, $P=.002$] and benzodiazepines [χ^2 (1, $N=56$)=13.23, $P=.000$]. Of the individuals that attended STARS, 9.1% misused codeine only (all products) and 66.7% misused benzodiazepines, and STARS accounted for 21.4% and 84.6% of their misuse across all services respectively.

Heroin use in the last month was statistically associated with OST being prescribed [χ^2 (1, $n=56$)=9.16, $P=.005$] and the use of supervised consumption [χ^2 (3, $n=56$)=22.68, $P=.000$]. Since SMS may mitigate risks associated with concomitant use of other substances at the same time as providing OST by using supervised consumption, the relationship between supervised consumption, OST type and the misuse of benzodiazepines and codeine products was explored further. Of those who were prescribed buprenorphine, 91.7%

Table 3. Summary of medication prescribed for substance use and use of other substances.

TYPE OF MEDICATION	RELAPSE PREVENTION	ORAL SUBSTITUTION TREATMENT	BENZODIAZEPINE	UNKNOWN	TOTAL
MEDICATION NAME	ACAMPROSATE/ NALTREXONE TABLETS	BUPRENORPHINE/BUPRENORPHINE- NALOXONE SUBLINGUAL TABLETS/ METHADONE ORAL SOLUTION (GENERIC/SUBOXONE®/SUBUTEX®/ PHYSEPTONE®)	DIAZEPAM TABLET	NOT STATED	
Number of respondents	3	35	1	1	40
Number on supervised consumption	0	10 [1 not stated]	0	1	11 [1 not stated]
Number taking medication differently to how prescribed	0	3	0	0	3
Number using alcohol on top	3	12	1	1	17
Number using tobacco/vaping on top	2	27	1	1	31
Number using illicit substances on top	2	20	1	1	24

misused codeine: no individual who was prescribed OST and reported codeine misuse was known to be on supervised consumption.

Discussion

Key findings

The demographic characteristics of respondents were broadly typical of national English SMS data sets: the mean age of 39 years, men predominated and the prevalent use of cannabis, crack/cocaine and heroin.¹⁹ The high rates of concomitant OTC/POM misuse and prescribed interventions for SMS, most notably medication, which is associated with increased risk of sedation, respiratory depression and therefore accidental overdose is of concern and has been the subject of national alerts.⁵² This may be further compounded by the use of illicit substances and alcohol,⁹ especially where daily and dependent use was reported.

During COVID-19, a statistically significant association between changes in OTC/POM misuse and illicit substance use were identified, though more changes were reported in OTC/POM misuse. The self-reported medication adherence rate of 92.5% is notable, as in the general population, only about half of people take their medication as prescribed⁵³ and especially when considering the risk of misuse of these medicines in this population and additionally in the context of a pandemic. Qualitative data indicated that the dynamic approach to tailoring prescribed interventions to the needs of individuals, (and specifically in relation to the liberalisation of methadone) were overwhelmingly positively received. The preference (81.3%) for paper completions was perhaps to be expected given the known digital poverty in this service user population⁵⁴ and the organisations lack of familiarity with distributing online equivalents.

Strengths and weaknesses and comparison to other studies

The data was collected from a single national organisation (Humankind) and over a year where several changes in pandemic restrictions were experienced in England. The low number of completed surveys received meant that reliability to assess the data quality and sensitivity analysis of the survey methodology were not possible. It further highlights the challenges of conducting research during COVID-19, given the notable reduction of footfall in the services, infection control considerations, pressures on staff limiting their capacity to distribute the questionnaires in person and reliance upon telephone consultations which reduced opportunities for sharing the online versions. Whilst it was not possible to calculate the response rate because SMS attendance can be unplanned and not documented (eg, drop-in clinics), low levels of survey completion in this population have equally been found in other studies.^{55,56}

All data has been included in the analyses; however, the χ^2 test does not provide information on the strength of the association or on whether the relationship is causal.⁵⁷ The *t*-test was not utilised since all of the data could be captured as categorical variables. The limited sample size makes it difficult to generalise the findings and as there is a lack of confidence in data saturation being reached for qualitative data, the findings should be interpreted with caution. Whilst it is hoped that the anonymous nature of the questionnaires enabled individuals to give honest responses, the potential impact of response bias is also important to consider, and this may be further compounded if individuals are not fully aware of how much or what they consumed when intoxicated or may have difficulties recollecting what they have used during the preceding month.

Table 4. Summary of statistically significant ($P < .005$) Pearson chi-square tests and associated likelihood ratios.

CATEGORIES TESTED		PEARSON CHI-SQUARE (χ^2)			LIKELIHOOD RATIO		
CATEGORY 1	CATEGORY 2	VALUE	DF	EXACT SIGNIFICANCE (TWO-SIDED)	VALUE	DF	EXACT SIGNIFICANCE (TWO-SIDED)
Changes to illicit use during COVID-19	Changes to OTC/POM misuse during COVID-19	18.074	2	0.000	21.832	2	0.000
Used heroin in the last month	On supervised consumption for prescribed intervention	22.678	3	0.000	22.335	3	0.000
Used heroin in the last month	On OST for prescribed intervention	9.164	1	0.005	13.189	1	0.002
Codeine (all types) only misused	Benzodiazepines misused	16.178	1	0.000	21.526	1	0.000
Codeine (all types) misused	Benzodiazepines only misused	9.130	1	0.003	12.803	1	0.002
Codeine (combination products) misused	Benzodiazepines misused	16.599	1	0.000	18.514	1	0.000
Codeine (all types) misused	Benzodiazepines misused	14.957	1	0.000	15.970	1	0.000
Codeine (combination products) misused	On methadone for prescribed intervention	12.410	1	0.001	13.932	1	0.001
Codeine (all types) misused	On methadone for prescribed intervention	10.336	1	0.002	10.980	1	0.002
Codeine (all types) only misused	On methadone for prescribed intervention	8.878	1	0.004	10.503	1	0.004
Codeine (combination products) misused	On buprenorphine for prescribed intervention	10.267	1	0.002	10.015	1	0.005
Codeine (all types) only misused	On buprenorphine for prescribed intervention	14.141	1	0.001	12.654	1	0.001
Codeine (all types) misused	On buprenorphine for prescribed intervention	14.857	1	0.000	16.189	1	0.000
Benzodiazepines misused	On methadone for prescribed intervention	15.901	1	0.000	16.707	1	0.000
Benzodiazepines misused	On buprenorphine for prescribed intervention	13.236	1	0.000	17.812	1	0.000
Codeine (all product types) only misused	STARS SMS accessed	10.846	1	0.002	11.034	1	0.002
Benzodiazepines misused	STARS SMS accessed	13.231	1	0.000	14.083	1	0.000

Whilst being mindful of the sample size, the types of medication being misused was similar to other studies, such as a recent comparative analysis by Iwanicki et al⁵⁸ who identified that tramadol misuse was infrequent in comparison to other opioids. The reports of 'monkey dust' reported in STARS SMS was perhaps to be expected due to this known local geographical issue.⁵⁹ Perhaps fewer people than expected reported changes to their use of illicit substances, given the changes to the illicit drug market reported by others.²⁹ As most responses (56.6%) were from the STARS service this may have influenced the findings of a

statistically significant association between codeine and benzodiazepine misuse and their level of representation when compared to other services.

The findings that OTC/POM misuse is usually oral, that patterns of misuse vary significantly and that medicines are obtained legally via prescriptions and pharmacy sales or illegally from street dealers and unregulated online sales have been similarly identified.²¹ The reasons for the changes in OTC/POM misuse and other substance use relating to the pandemic, such as increased stress due to job loss, boredom, loneliness,

heightened anxiety and other mental health issues were perhaps to be expected and have been found by others.³³ The positive responses to changes in doses and liberalisation during COVID-19 have similarly been reported.³³ Where changes in alcohol consumption were found, the majority increased their use, reflecting national reports which have outlined associated morbidity and mortality.^{60,61}

Implications for clinicians, policymakers and researchers

Although based on limited data, these findings suggest that there may be a need for increased vigilance for interpersonal violence and sex working. Subsequent increases in the use of substances and OTC/POM misuse during COVID-19 due to associated trauma perpetuating this are widely acknowledged⁴; indeed, reports of increased interpersonal violence during the pandemic have been noted nationally.⁶²

Increases in alcohol use further highlights that SMS, commissioners and other health and social care providers such as acute secondary care services will likely need to respond to this post-pandemic. Similarly, every respondent who reported changes in tobacco/vaping also found their use increased suggesting the need for additional vigilance for associated smoking cessation interventions and respiratory disease.

Clinicians and policymakers need to ensure that the benefits to liberalisation are not lost post-pandemic. However, it is important to note the increase in drug related deaths, in the UK and elsewhere, including in those associated with methadone, though the impact of liberalisation is yet to be fully established.^{14,63} Additionally, the national guidance which had supported SMS to liberalise dispensing arrangements to a greater extent has since been rescinded³⁵; it is therefore important that monitoring changes in national prescribing practices and the consequent evaluation of its impact remains ongoing.

Furthermore, the statistically significant association between concomitant heroin use with the use of supervised consumption and OST is likely indicative of appropriate clinical practice. However, somewhat inconsistently, the misuse of codeine appeared to be managed rather differently, as indicated by the absence of any supervised consumption and 91.7% of people prescribed buprenorphine reported misusing codeine. This warrants further investigation and review of current SMS prescribing practices. The challenges in managing withdrawal symptoms which initiate and perpetuate misuse are also not to be underestimated. Additionally, these issues indicate a potential training and education need for SMS staff and clinicians. Such an approach is supported by the UK Government's new drug strategy 'From Harm to Hope'.⁶⁴ Education for people using substances should also be considered to further aid risk recognition and improve accuracy of reporting of use.

Since there were reports of switching between different substances, in response to changes in accessibility, availability

and cost, there must be ongoing monitoring for associated trends and potential changes in SMS delivery needs. Additionally, if steps are taken to limit access, for example by rescheduling/ceasing prescribing of opioid products, these should be implemented with care to avoid unintended consequences such as people seeking unregulated alternatives.^{65,66}

Since data saturation was not felt to have been achieved, additional research, such as qualitative interviews should allow for more detailed exploration and enable triangulation to assess the validity of the findings. This could support a greater understanding of the reasons for OTC/POM misuse, impact upon other substances used, physical/mental wellbeing, harm reduction provision (such as take home naloxone supplies) and views about SMS developments identified from the questionnaire. Furthermore, it should allow for a greater exploration of experiences during the entirety of COVID-19, including the impact of different stages of the pandemic. Such methodology is common in health services research where there are complex issues, to elaborate or explain or enhance the usefulness of findings and to counterbalance and complement the limitations of the different data sets.⁶⁷⁻⁷⁰

As all participants identified as Caucasian, this highlights the need for further exploration amongst individuals from other groups, which is important as there may be unique racial/ethnic profiles associated with differences in misuse.^{71,72} Future researchers should also consider providing service users with digital devices and permit data collection during telephone consultation to increase response rates.

Conclusion

OTC/POM misuse, including polypharmacy and the concomitant use of other substances by people accessing SMS is common and has continued during the COVID-19. Oral benzodiazepines, codeine products and pregabalin predominate, and during the pandemic the use of different substances changed for some people. SMS need to be vigilant for these issues and mitigate the associated risks, for example with ensuring appropriate provision of harm reduction interventions. Where people had their medication dispensing regimens liberalised this was generally well received and a high level of adherence was reported. Conducting research during the pandemic is challenging and consequent limited sample size impacts upon the strength of the findings and generalisability. Further research such as the use of qualitative interviews to further explore the issues identified, including any associated changes to SMS delivery is required.

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Author Contributions

RG conceived the paper, designed the study, conducted the data analyses and led on writing the initial draft. RV contributed to the manuscript writing. IM supervised the research and contributed to the manuscript writing. All authors contributed to the critical revisions, read and approved the final manuscript.

Supplemental Material

Supplemental material for this article is available online.

REFERENCES

- Barrett SP, Meisner JR, Stewart SH. What constitutes prescription drug misuse? Problems and pitfalls of current conceptualizations. *Curr Drug Abuse Rev.* 2008;1:255-262.
- Smith SM, Dart RC, Katz NP, et al. Classification and definition of misuse, abuse, and related events in clinical trials: ACTTION systematic review and recommendations. *Pain.* 2013;154:2287-2296.
- United Nations Office on Drugs and Crime (UNODC). The non-medical use of prescription drugs: Policy direction issues. 2011. Accessed May 10, 2021. <https://www.unodc.org/documents/drug-prevention-and-treatment/nonmedical-use-prescription-drugs.pdf>
- Dube SR, Felitti VJ, Dong M, Chapman DP, Giles WH, Anda RF. Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse childhood experiences study. *Pediatrics.* 2003;111:564-572.
- Floyd CN, Wood DM, Dargan PI. Baclofen in gamma-hydroxybutyrate withdrawal: patterns of use and online availability. *Eur J Clin Pharmacol.* 2018;74:349-356.
- Gittins R, Cole S. Buprenorphine for the management of kratom dependency during covid-19: a case report. *Drug Sci Policy Law.* 2021;7:1-7.
- Ali M, Mujahid A, Bulathsinghala CP, Surani S. Cardiac arrhythmia secondary to loperamide abuse and toxicity. *Cureus.* 2020;12:e6936.
- Chan GM, Stajic M, Marker EK, Hoffman RS, Nelson LS. Testing positive for methadone and either a tricyclic antidepressant or a benzodiazepine is associated with an accidental overdose death: analysis of medical examiner data. *Acad Emerg Med.* 2006;13:543-547.
- Gosso M, Moos R. Substance misuse among older adults: a neglected but treatable problem. *Addiction.* 2008;103:347-348.
- Jones JD, Mogali S, Comer SD. Polydrug abuse: a review of opioid and benzodiazepine combination use. *Drug Alcohol Depend.* 2012;125:8-18.
- Lyndon A, Audrey S, Wells C, et al. Risk to heroin users of polydrug use of pregabalin or gabapentin. *Addiction.* 2017;112:1580-1589.
- Macleod J, Steer C, Tilling K, et al. Prescription of benzodiazepines, z-drugs, and gabapentinoids and mortality risk in people receiving opioid agonist treatment: observational study based on the UK Clinical Practice Research Datalink and Office for National Statistics death records. *PLoS Med.* 2019;16:e1002965.
- Advisory Council on the Misuse of Drugs (ACMD). Diversion and illicit supply of medicines. 2016. Accessed May 10, 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/580296/Meds_report_-_final_report_15_December_LU__2_.pdf
- Office for National Statistics (ONS). Deaths related to drug poisoning in England and Wales: 2020 registrations. 2021. Accessed May 10, 2021. <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsrelatedtodrugpoisoninginenglandandwales/2020>
- Bohnert AS, Eisenberg A, Whiteside L, Price A, McCabe SE, Ilgen MA. Prescription opioid use among addictions treatment patients: nonmedical use for pain relief vs. other forms of nonmedical use. *Addict Behav.* 2013;38:1776-1781.
- Butler SF, Black RA, Serrano JM, Wood ME, Budman SH. Characteristics of prescription opioid abusers in treatment: prescription opioid use history, age, use patterns, and functional severity. *J Opioid Manag.* 2010;6:239-241, 246-252.
- Pv A, Abidin E, Jun Wen T, Subramaniam M, Cheok C, Song G. Correlates of non-medical prescription drug misuse among a treatment-seeking population: a comparison with illicit drug users. *Int J Environ Res Public Health.* 2018;15:1978.
- YouGov. The YouGov big survey on drugs: prescription drugs. 2021. Accessed May 10, 2021. <https://yougov.co.uk/topics/lifestyle/articles-reports/2022/01/24/yougov-big-survey-drugs-britons-taking-prescription>
- Public Health England (PHE). Substance misuse treatment for adults: statistics 2019 to 2020: Report. 2020. Accessed May 10, 2021. <https://www.gov.uk/government/statistics/substance-misuse-treatment-for-adults-statistics-2019-to-2020>
- Public Health England (PHE). National drug treatment monitoring system (NDTMS): adult drug and alcohol treatment business definitions. Core dataset P V14.3. 2019. Accessed May 10, 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897149/NDTMS_adult_drug_and_alcohol_treatment_business_definitions_V14.3.pdf
- Rosenblum A, Parrino M, Schnoll SH, et al. Prescription opioid abuse among enrollees into methadone maintenance treatment. *Drug Alcohol Depend.* 2007;90:64-71.
- Marsden J, White M, Annand F, et al. Medicines associated with dependence or withdrawal: a mixed-methods public health review and national database study in England. *Lancet Psychiatry.* 2019;6:935-950.
- Public Health England (PHE). Dependence and withdrawal associated with some prescribed medicines: an evidence review. 2019. Accessed May 10, 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/940255/PHE_PMR_report_Dec2020.pdf
- Department of Health and Social Care (DHSC). Good for you, good for us, good for everybody a plan to reduce overprescribing to make patient care better and safer, support the NHS, and reduce carbon emissions. 2021. Accessed May 10, 2021. <https://www.gov.uk/government/publications/national-overprescribing-review-report>
- Davies J, Cooper RE, Moncrieff J, Montagu L, Rae T, Parhi M. The costs incurred by the NHS in England due to the unnecessary prescribing of dependency-forming medications. *Addict Behav.* 2022;125:107143.
- Dunlop A, Lokuge B, Masters D, et al. Challenges in maintaining treatment services for people who use drugs during the COVID-19 pandemic. *Harm Reduct J.* 2020;17:26.
- European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Update on the implications of COVID-19 for people who use drugs (PWUD) and drug service providers. 2020. Accessed May 10, 2021. <https://www.emcdda.europa.eu/system/files/publications/12879/emcdda-covid-update-1-25.03.2020v2.pdf>
- Aldridge J, Garius L, Spicer J, et al. Drugs in the time of COVID: the UK drug market response to lockdown restrictions. 2021. Accessed May 10, 2021. <https://www.release.org.uk/sites/default/files/pdf/publications/Release%20COVID%20Survey%20Interim%20Findings%20final.pdf>
- CREW. Drugs at CREW trend report 2019-2020. 2021. Accessed May 10, 2021. <https://www.drugsandalcohol.ie/33706/1/Drugs-at-CREW-trend-report-2019-2020.pdf>
- European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). EU drug markets: Impact of COVID-19. 2020. Accessed May 10, 2021. https://www.emcdda.europa.eu/system/files/publications/13097/EU-Drug-Markets_Covid19-impact_final.pdf
- Mallet J, Dubertret C, Le Strat Y. Addictions in the COVID-19 era: current evidence, future perspectives a comprehensive review. *Prog Neuropsychopharmacol Biol Psychiatry.* 2021;106:110070.
- Alcohol Change UK. New research reveals that without action lockdown drinking habits may be here to stay. 2020. Accessed May 10, 2021. <https://s3.amazonaws.com/files.alcoholchange.org.uk/images/Lockdown-easing-press-release-FINAL.pdf>
- Kesten JM, Holland A, Linton MJ, et al. Living under coronavirus and injecting drugs in Bristol (LUCID-B): a qualitative study of experiences of COVID-19 among people who inject drugs. *Int J Drug Policy.* 2021;98:103391.
- NHS England and NHS Improvement (NHSE&I). Clinical guide for the management of people with alcohol dependence during the coronavirus pandemic, version 1. 2020. Accessed May 10, 2021. https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/04/C0157-Specialty-guide_-_Alcohol-Dependence-and-coronavirus_8-April.pdf
- Public Health England (PHE). COVID-19: guidance for commissioners and providers of services for people who use drugs or alcohol. 2021. Accessed May 10, 2021. <https://www.gov.uk/government/publications/covid-19-guidance-for-commissioners-and-providers-of-services-for-people-who-use-drugs-or-alcohol/covid-19-guidance-for-commissioners-and-providers-of-services-for-people-who-use-drugs-or-alcohol>
- Public Health England (PHE). Drug harms assessment and response team (DHART) quarterly summary for professionals. 2021. Accessed May 10, 2021. https://khub.net/web/phe-national/public-library/-/document_library/v2WsRK3ZIEig/view/345595238
- Department of Health and Social Care (DHSC). Drug misuse and dependence: UK guidelines on clinical management. 2017. Accessed May 10, 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/673978/clinical_guidelines_2017.pdf
- National Institute for Health and Social Care Excellence (NICE). Medicines associated with dependence or withdrawal symptoms: Safe prescribing and withdrawal management for adults. 2022. Accessed May 10, 2021. <https://www.nice.org.uk/guidance/ng215>
- McCabe BE, Santisteban DA, Mena MP, Duchene DM, McLean C, Monroe M. Engagement, retention, and abstinence for three types of opioid users in florida. *Subst Use Misuse.* 2013;48:623-634.

40. Rigg KK, Monnat SM. Comparing characteristics of prescription painkiller misusers and heroin users in the United States. *Addict Behav.* 2015;51:106-112.
41. Noble SM, Hollingworth W, Tilling K. Missing data in trial-based cost-effectiveness analysis: the current state of play. *Health Econ.* 2012;21:187-200.
42. Gittins R, Missen L, Maidment I. Misuse of medication in adult substance misuse services: a systematic review protocol. *BMJ Open.* 2021;11:e047283.
43. Brod M, Tesler LE, Christensen TL. Qualitative research and content validity: developing best practices based on science and experience. *Qual Life Res.* 2009;18:1263-1278.
44. Patrick DL, Burke LB, Gwaltney CJ, et al. Content validity—establishing and reporting the evidence in newly developed patient-reported outcomes (PRO) instruments for medical product evaluation: ISPOR PRO good research practices task force report: part 1—eliciting concepts for a new PRO instrument. *Value Health.* 2011;14:967-977.
45. Patrick DL, Burke LB, Gwaltney CJ, et al. Content validity—establishing and reporting the evidence in newly developed patient-reported outcomes (PRO) instruments for medical product evaluation: ISPOR PRO Good Research Practices Task Force report: part 2—assessing respondent understanding. *Value Health.* 2011;14:978-988.
46. Boynton PM. Administering, analysing, and reporting your questionnaire. *BMJ.* 2004;328:1372-1375.
47. Humankind. Impact report 2020/2021. 2021. Accessed May 10, 2021. <https://humankindcharity.org.uk/wp-content/uploads/2021/10/Impact-Report-2020-21.pdf>
48. Guest G, Bunce A, Johnson L. How many interviews are enough?: an experiment with data saturation and variability. *Field Methods.* 2006;18:59-82.
49. Green J, Thorogood N. *Qualitative Methods for Health Research.* 3rd ed. SAGE Publications Ltd; 2014.
50. Field A. *Discovering Statistics Using IBM SPSS Statistics.* 5th ed. SAGE Publications Ltd; 2018.
51. Fink A. *How to Manage, Analyze, and Interpret Survey Data.* 2nd ed. SAGE Publications Ltd; 2003.
52. Medicines and Healthcare products Regulatory Agency (MHRA). Benzodiazepines and opioids: reminder of risk of potentially fatal respiratory depression. 2020. Accessed May 10, 2021. <https://www.gov.uk/drug-safety-update/benzodiazepines-and-opioids-reminder-of-risk-of-potentially-fatal-respiratory-depression#:~:text=benzodiazepines%20>
53. Nieuwlaat R, Wilczynski N, Navarro T, et al. Interventions for enhancing medication adherence. *Cochrane Database Syst Rev.* 2014;2014:CD000011.
54. Perri M, Guta A, Gagnon M, et al. Developing a digital health strategy for people who use drugs: lessons from COVID-19. *Digit Health.* 2021;7:20552076211028404.
55. Baird CR, Fox P, Colvin LA. Gabapentinoid abuse in order to potentiate the effect of methadone: a survey among substance misusers. *Eur Addict Res.* 2014;20:115-118.
56. Zhao J, Stockwell T, Macdonald S. Non-response bias in alcohol and drug population surveys. *Drug Alcohol Rev.* 2009;28:648-657.
57. Schober P, Vetter TR. Chi-square tests in medical research. *Anesth Analg.* 2019;129:1193.
58. Iwanicki JL, Schwarz J, May KP, Black JC, Dart RC. Tramadol non-medical use in four European countries: a comparative analysis. *Drug Alcohol Depend.* 2020;217:108367.
59. Matthews-King A. 'Monkey dust': What is the drug 'causing a public health crisis' that induces hallucination, paranoia and dulls sensitivity to pain? 2018. Accessed May 10, 2021. <https://www.independent.co.uk/news/health/monkey-dust-hulk-drugs-synthetic-addict-uk-crime-police-stoke-staffordshire-midlands-a8486391.html>
60. Public Health England (PHE). Press release: alcoholic liver deaths increased by 21% during year of the pandemic. 2021. Accessed May 10, 2022. <https://www.gov.uk/government/news/alcoholic-liver-deaths-increased-by-21-during-year-of-the-pandemic>
61. Public Health England (PHE). Research and analysis: alcohol consumption and harm during the COVID-19 pandemic. 2021. Accessed May 10, 2021. <https://www.gov.uk/government/publications/alcohol-consumption-and-harm-during-the-covid-19-pandemic>
62. Ivandić R, Kirchner T, Linton B. Discussion paper: changing patterns of domestic abuse during Covid-19 lockdown. 2020. Accessed May 10, 2021. <https://cep.lse.ac.uk/pubs/download/dp1729.pdf>
63. Friedman J, Akre S. COVID-19 and the drug overdose crisis: uncovering the deadliest months in the United States, January–July 2020. *Am J Public Health.* 2021;111:1284-1291.
64. Department of Health and Social Care (DHSC). From harm to hope: a 10-year drugs plan to cut crime and save lives. 2022. Accessed May 10, 2022. <https://www.gov.uk/government/publications/from-harm-to-hope-a-10-year-drugs-plan-to-cut-crime-and-save-lives/from-harm-to-hope-a-10-year-drugs-plan-to-cut-crime-and-save-lives>
65. Caulkins JP, Goyeneche LA, Guo L, Lenart K, Rath M. Outcomes associated with scheduling or up-scheduling controlled substances. *Int J Drug Policy.* 2021;91:103110.
66. Pearce C. UK medicines regulator 'will consider' ban on over-the-counter codeine. *Pulse.* 2020. Accessed May 10, 2021. <https://www.pulsetoday.co.uk/news/clinical-areas/prescribing/uk-medicines-regulator-will-consider-ban-on-over-the-counter-codeine/>
67. Barbour RS. The case for combining qualitative and quantitative approaches in health services research. *J Health Serv Res Policy.* 1999;4:39-43.
68. Bryman A. Integrating quantitative and qualitative research: how is it done? *Qual Res.* 2006;6:97-113.
69. Johnson RB, Onwuegbuzie AJ. Mixed methods research: a research paradigm whose time has come. *Educ Res.* 2004;33:14-26.
70. O' Cathain A, Murphy E, Nicholl J. Why, and how, mixed methods research is undertaken in health services research in England: a mixed methods study. *BMC Health Serv Res.* 2007;7:85.
71. Ford JA, Rigg KK. Racial/ethnic differences in factors that place adolescents at risk for prescription opioid misuse. *Prev Sci.* 2015;16:633-641.
72. Harrell ZA, Broman CL. Racial/ethnic differences in correlates of prescription drug misuse among young adults. *Drug Alcohol Depend.* 2009;104:268-271.