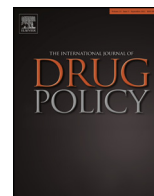




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# Monitoring novel psychoactive substances allegedly offered online for sale in Persian and Arabic languages

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### ABSTRACT

**Background:** Numbers of novel psychoactive substances (NPS) have been rapidly increasing over the past few years, with unprecedented challenges on traditional drug control systems. The web has been involved in the promotion and knowledge dissemination of NPS, which are being presented online as safer/legal alternatives to illicit drugs. The physical, psychological and social harms associated with NPS have been studied so far mainly in Europe and other English speaking countries. The aim of this research is to provide knowledge on the provision of NPS information/purchase opportunities to Middle East customers, whilst monitoring the Internet in Arabic and Farsi.

**Methods:** Web analysis/assessments were carried out in both Farsi and Arabic between 2011 and 2013. Sources were scrutinized with the help of different search engines, including Google Arabic and Google Persian, to carry out searches focusing on both NPS retailers' and social network websites.

**Results:** The research identified 45 NPS apparently offered for purchase online. Most of these products were of synthetic origin; a few herbal stimulants were identified as well. The pro drug websites were not here easily identified, being hidden behind other, unrelated, websites.

**Conclusion:** Present results may constitute a public health challenge to be considered at both national and worldwide level. New legislative frameworks should also be encouraged in order to ensure a better response to the current threat posed by rapid emergence of these substances.

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### Introduction

The recent years have witnessed a change in drug scenarios, in association with the appearance of a range of novel psychoactive substances (NPS). NPS are analogues of more classical drugs of abuse, such as amphetamines (Schifano, Corkery, Naidoo, Oyefeso, & Ghodse, 2010), in order to escape local/international regulations. Very little is known about NPS pharmacological effects; addictive potential; presence of impurities; and drug-drug interactions (Assi, Fergus, Stair, Corazza, & Schifano, 2011, EMCDDA, 2011), with these effects being mostly unknown to the mental health community

(Simonato et al., 2013). Conversely, most consumers perceive NPS as being legal and hence somewhat safe (Corazza et al., 2013).

The Internet plays a major role in the dissemination of NPS-related knowledge (Corazza et al., 2013). Purchasing these substances can occur easily online, without direct contact with the seller. This has caused a change in the pattern of production, consumption, promotion, distribution and purchase of misusing drugs (Schifano, Albanese, & Fergus, 2011; Schifano, Corazza, Deluca, & Davey, 2009), with the number of NPS-related rogue websites continuously increasing over time (EMCDDA, 2011).

As a result of this, the EU Commission-funded Psychonaut Web Mapping (2008–2010) and ReDNet (2010–2012) projects were developed to respond to changes in these drug scenarios. Both projects aimed at monitoring the emergence of NPS, disseminating the resulting information to relevant healthcare professionals by assessing the web in eight different languages from a range of countries: UK, Norway, Belgium, Germany, Hungary, Poland, Italy and Spain, with some 700 NPS derivatives having been identified over time (Corazza et al., 2013; Deluca et al., 2012).

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However, there is still a lack of extensive and thorough focus on analysis of NPS data made available online in languages from the Middle East. This is somewhat surprising, since high levels of use of the Internet in the Middle East among the youths have been reported (Internet World Stats, 2012). Bigdeli, Corazza, Aslanpour, and Schifano (2013) investigated the online availability of NPS for purchase using the Farsi/Persian language. The study clearly identified the possibility to acquire online a range of NPS ( $n = 34$ ), mostly of synthetic origin. Typical NPS-selling websites were hidden behind other, unrelated, pages.

The aim of this work was to monitor and identify emerging NPS products in Arabic and Persian languages.

## Methods

Following a first phase of the project, characterized by a range of website discovery pilot activities (Bigdeli et al., 2013) the present study focused on web analysis/assessments carried out in both Farsi and Arabic between October 2011 and September 2013. Sources were scrutinized with the help of different search engines (e.g. Google Scholar; Pubmed; ISI Web of Knowledge; Google in Arabic; Google in Persian; Science Direct; and Scopus). We focused on websites, social network websites, chat rooms, newsgroups, forums and grey literature. Searches were carried out using the following key words: 'new psychoactive substance'; 'legal high'; 'drugs of abuse'; and 'research chemical'. In addition, the terms 'herbal highs', 'Spice', 'kratom', 'Salvia', mephedrone, 'benzylpiperazine', 'salvinorin A', 'lysergamide', 'synthetic cannabinoids', 'psychoactive compounds', 'mimic psychoactive effects' and 'illicit drugs' were used.

Although 118 NPS-related websites were here identified, 53 of them turned out to be educational/anti drug/public health websites, typically commenting on the dangers of self-administering with NPS. The remaining 65 websites here examined, on the other hand, were deemed to be pro drug websites and appeared to be offering NPS for purchase.

The study was cleared by the University of Hertfordshire School of Pharmacy Ethics Committee, Hatfield, UK (15 December 2010; PHAEC/10-42).

## Results

A total of 45 NPS were identified from websites/online shops presented in Arabic and Farsi languages. NPS here allegedly offered for sale were from either synthetic/semi-synthetic or natural origin (Table 1).

### Synthetic/semi-synthetic

This category most typically included: cathinone derivatives (e.g. methylone, flephedrone, naphyrone, butylone and mephedrone); a range of classical/latest generation psychedelic phenethylamines (e.g. MDAI, 6-APB, 4-FA, 5-IAI, DOI, B-Fly, 2C-D, 2C-I, etc.); ketamine derivatives (e.g. methoxetamine; 4-MeO-PCP); tryptamines (e.g. AMT; 5-MeO-DMT and 5-MeO-MIPT). Finally, a range of 'Spice' derivatives (including: 'JWH-018'; 'JWH-250'; 'JWH-073'; and 'JWH-200') were also here identified and were sold as 'herbal incense'. These herbal smoking products, containing one or more synthetic cannabimimetics, were offered to customers as legal substitutes of cannabis, although cannabimimetics' affinity for CB1 receptor, and hence their potency, is several times higher than that of THC itself (Schifano et al., 2009).

**Table 1**  
NPS products identified from the Internet websites.

<i>Synthetic/semisynthetic; amphetamine-type stimulants</i>	<i>Synthetic/semisynthetic; cannabinoid receptor agonists</i>
MDAI	AM-2201
5-IAI	JWH-018
6-APB	JWH-250
AMT	JWH-073
MDAT	JWH-200
2C-D	JWH-122
2C-E	
2C-I	<i>Synthetic/semisynthetic; tryptamine derivatives</i>
	5-MeO-MIPT
2C-P	5-MeO-DMT
2C-T-2	
4-FA	
Fluoromethamphetamine	<i>Synthetic/semisynthetic; miscellaneous</i>
	Methoxetamine;
5-APB	4-MeO-PCP
DOI	(PCP-like drugs)
B-Fly	GBL (sedative)
6-Chloro-2-aminotetralin (6-CAT)	
<i>Synthetic/semisynthetic; cathinone derivatives</i>	
Mephedrone	

### Natural products

Possibly due to the cultural belief in the Middle East, including Iran, of herbal products being safe/free of adverse effects (Bigdeli et al., 2013), natural psychoactives appeared here to receive positive feedback/comments from users. Lack of legal clarity relating to herbal products containing 'natural' substances may have been exploited by online retailers. As an example, hallucinogenic/'magic' mushrooms containing psilocybin and psilocin (Hallok, Dean, Knecht, Spencer, & Taverna, 2012) appeared here to represent very popular 'highs' available on the Persian online market. These products were offered as either spores or mature mushrooms, whilst being advertised as possessing 'relaxing effects'. Conversely, Salvia divinorum (available as extracts or leaves; Deluca et al., 2012), was here nicknamed as 'Maryam Goli' and was advertised as an increasingly popular, intense and short-acting hallucinogenic plant, whilst being identified as a 'recognised replacement' for methylphenidate to increase concentration/cognitive abilities of students on pre-exam nights. Myragina speciosa/'Kratom', available as tea/extracts/smokable leaves, proved to be very popular as well, with online retailers claiming its use being associated with feelings of happiness and joyfulness. Ephedra sinica, the source of ephedrine/pseudoephedrine (Abourashed, Abir, El-Alfy, & Walker, 2003), appeared here to be very popular indeed in both Farsi and Arabic language websites. The mescaline-containing peyote cactus ('Sky key'; 'Mescal') seemed to be advertised by retailers whilst taking advantage of the strong religious beliefs of vulnerable individuals, who would allegedly be facilitated in achieving 'relaxation/feeling of pure beliefs', whilst 'being closer to God'.

### General characteristics of pro drug/vending websites

The products were typically sold in attractive packages providing ambiguous descriptions of their content, including 'bath salts', 'not for human consumption', and 'plant feeders'. NPS products were also advertised as safe, legal and pure, with a minority of websites showing a 'health certification' as well for their products. A small percentage of pro drug websites presented with specific logos, giving the impression to their customers that they had been provided with a 'seal of approval' by appropriate regulatory agencies and hence appearing to be 'legitimate'. Conversely, a range of these websites appeared to have been controlled/blocked/filtered

over time, possibly by drug enforcement agencies, within few months, and typically in less than 6 months.

Overall, pro drug websites did not provide customers with any information relating to their postal address/permanent land-line numbers, but presented instead with email addresses and/or temporary mobile numbers. Although due to these reasons this assessment proved to be somewhat problematic, online retailers appeared to be typically located in China, UK, USA, Cameroon, Nigeria and Tanzania. Most retailers claiming supply within two days/provision of worldwide shipping and several payment options (e.g. credit/debit card; cheque) were made available. Prices of NPS varied (range: 8–230 USD) here according to both the index NPS offered for sale and the different online retailers. Most websites seemed to offer for purchase a range (typically, 5–10) of different psychoactive products, sometimes changing their offers according to molecules' availability, price, and customers' demands as well. According to frequent customers' posts/comments here identified, however, some websites did not seem to actually supply the required products.

Pro drug websites here commented presented in a 'come and go' fashion, e.g. appeared and disappeared fairly rapidly, with frequent (e.g. within a few weeks) changes of logos/names. Access did not typically require any specific passwords, and most vending activities seemed to be located in the 'superficial', as opposed to the 'deep', web. However, roughly half of vending websites were here hidden behind other, more 'innocuous'/generic, webpages (e.g. selling furniture, house supplies, etc.).

## Discussion

The present study investigated the online availability of NPS products on Arabic and Persian websites. Results show how the web plays a major role in the spread of NPS in the Middle East as well (Corazza et al., 2013; EMCDDA, 2011; Schifano et al., 2009). A wide range of NPS are easily available online to those in possession of even a fairly limited level of financial resources, with vulnerable individuals such as adolescents possibly being targeted. Hence, this is a new and rapidly emerging challenge to be considered by Middle East health care professionals (Zarghami, 2011) and law enforcement authorities. Present data confirms concerns previously identified by the European Monitoring Centre for Drugs and Drug Abuse (EMCDDA, 2012). Furthermore, present data confirm those suggested by a pilot study carried out on websites in Persian language in 2012 (Bigdeli et al., 2013), whilst highlighting an increase of NPS-related websites since then.

Identified NPS-related websites proved to be here less visible and clearly more concealed than typical NPS-related EU languages websites. According to the United Nations Drugs Conventions, it is clear that unauthorized trade in psychoactive substances, whether illicit or medicinal, is a criminal offence. However, it seems that at present there is a lack of strict control by the authorities, possibly because these activities require time and extensive levels of resources. On the other hand, it might also be possible that a number of websites had been blocked/inactivated prior to our investigation. Indeed, restriction levels in selling NPS products have also increased, with importing and selling mephedrone having recently been banned in Iran (Congress 60, 2013). In fact, although the online market of NPS has expanded, both awareness of NPS risks and the number of NPS educational websites has grown as well (Iversen, 2011).

One of the limitations of the study is that present findings may have been somewhat biased by the choice of the search terms, with a more complete set of data possibly resulting from the use of a larger number of key words. Since no attempt at purchasing NPS products was made here, it remains to be better determined in future studies whether NPS retailers are actually providing

customers with the molecules purchased or if indeed the order is being supplied/shipped at all.

Monitoring of NPS online availability is a challenging task, especially considering its dynamic nature. Therefore, legislative bodies and regulatory agencies require regular and flexible monitoring mechanisms with adequate research being required (EMCDDA, 2011; Iversen, 2011). In particular, there is a need to carry out regular analyses of NPS products made available online in order to establish the ingredients and identify any related health risks (Assi, Fergus, & Stair, 2012). In addition, investment in better education for young people on the harms associated with NPS is essential (Arunotayanun & Gibbons, 2012).

## Conflicts of interest

FS is a member of the Advisory Council on the Misuse of Drugs (ACMD; UK).

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