



“Legal highs” on the net—Evaluation of UK-based Websites, products and product information

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ABSTRACT

Background: A vast array of substances are marketed as “legal highs” in the UK. These products are mainly marketed online and are packaged and produced to mimic illicit drugs. Little is known about the full range of products available at present and no studies have evaluated the product information provided to consumers.

Aims & Hypothesis: To describe the available legal high products marketed by UK-based Internet retailers and evaluate the product information provided to consumers.

Methods: Websites were identified using the terms “buy legal highs + UK” and two search engines. The first 100 hits and a random sample of 5% of the remaining results were screened. Websites based in the UK were included and all products were entered on a database. Information on product name, list price, claimed effects, side effects, contraindications and interactions was extracted. A descriptive analysis was conducted using SPSS v14.

Results: 115 Websites met the inclusion criteria but due to duplicate listings this was reduced to 39 unique Websites. 1308 products were found and evaluated. The average product price was 9.69 British pounds. Products took the form of pills (46.6%), smoking material (29.7%) and single plant material/extract (18.1%). Most products claimed to be stimulants (41.7%), sedatives (32.3%), or hallucinogens (12.9%). 40.1% of products failed to list ingredients, 91.9% failed to list side effects, 81.9% failed to list contraindications and 86.3% failed to list drug interactions. Top 5 products (with active ingredients in brackets) by frequency were Salvia divinorum (*Salvinorin A*), Kratom (*Mitragynine*), Hawaiian Baby Woodrose Seeds (*Lysergic Acid Amide*), Fly Agaric (*Ibotenic Acid*, *Muscimol*) and Genie (*JWH018*, *CP47497*). **Conclusions:** Products marketed as “legal highs” are easily available from UK-based Internet retailers and are reasonably affordable. Safety information provided to consumers is poor. Uninformed users risk serious adverse effects.

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1. Introduction

A vast array of substances are marketed as “legal highs” in the United Kingdom (UK). These products can be purchased online [1] and from high street retailers known as “head shops” [2] and include herbal smoking mixtures, plant materials and extracts, and tablets or powders designed to mimic illicit drugs. In other countries these products are also known as “herbal dietary supplements” [3], “herbal highs” [1] and “party pills” [4].

Media attention in the UK has largely focussed on piperazine based stimulant pills (designed to mimic ecstasy) [5,6] and herbal

smoking mixes (marketed as legal alternatives to cannabis) which have been found to contain synthetic cannabinoids [7–9]. Both piperazines and synthetic cannabinoids have recently been classified as controlled substances in the UK under the Misuse of Drugs Act 1971 (as amended in 2009) [10] following advice from the Advisory Council on the Misuse of Drugs (ACMD) [11,12] and the European Centre for Drugs and Drug Addiction (EMCDDA) [8,13]. Manufacturers appear to have anticipated this move and retailers are now selling “BZP-free” stimulant pills and different brands of herbal smoking blends [14].

A growing number of case reports from the UK and abroad have linked several legal high products with adverse effects [15–18]. In addition, user surveys have reported serious adverse effects requiring medical attention in 1–4% of respondents [19,20].

The size of the current UK market in legal highs is difficult to establish. Industry sources claim over 2 million doses of BZP based pills were sold in the UK between 2002 and 2006 [2] and one

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distributor claims to have shipped a peak level of 3600 doses a day to over 100 third party resellers prior to 2006 [21]. Media reports have estimated the domestic market in legal highs to be worth 10 million pounds [22] but the accuracy of this figure is questioned [23].

Evidence from the small number of UK case reports involving legal high products, suggest that substances are purchased at music festivals [24] and through drug dealers (where they can be passed off as illicit substances) [25] but preliminary evidence from user surveys suggest the vast majority of legal highs are purchased online [26].

Despite several studies on the availability of illegal drugs on the Internet in Europe [27,28], few similar studies on “legal highs” have been published. A study by Dennehy et al. in 2005, evaluated information on “herbal dietary supplements” (the term commonly used in the USA for “legal highs”) marketed online, but only focussed on retailers shipping to the USA [3]. In addition the study was limited by only evaluating the first 20 unique Websites per search engine and the first five products of each site. The study did reveal that UK-based Websites were the second largest source of “legal highs” to the USA, after Websites based in the USA. Similarly the 2008 & 2009 EMCDDA Annual Reports included brief descriptions of “online snapshots” of legal high retailers across Europe [1,14]. In 2008, 68 retailers were identified (52% of which were based in the UK) and in 2009, 115 were identified (37% based in the UK). In both reports the UK accounted for the largest percentage of retailers across Europe. Since the methodology was not described for both snapshots it is not clear if this represents a genuine reduction in the UK’s “market share”. Of note is that the figures represent an actual increase in UK retailers from 35 to 42, but once again it is unclear whether any inferences can be drawn from this.

The 2008 snapshot has recently been published in more detail by Hillebrand et al. [29]. Although 69 retailers were identified only 27 (39%) were evaluated fully. The study reported that over 500 products were advertised for sale but little further detail was provided. Both Dennehy et al. [3] and Hillebrand et al. [29] investigated information provided to consumers but the usefulness of this was limited by reporting results as a function of Websites and not of total products. For instance Hillebrand et al reported that 48% of Websites provided information on dosage for “some” of the products [29].

The above studies highlight the importance and validity of monitoring the online market in legal highs and the pre-eminent role of the UK-based market. A systematic evaluation of all products currently available from UK-based online retailers is therefore warranted.

2. Materials and methods

The identification and selection of Websites for screening, used methodology based on the Psychonaut 2002EU project (a multi language, European-wide evaluation of drugs on the web) [28]. Two search engines (Google™ and AltaVista™) were used to maximize coverage of the web, as each engine uses different techniques for Website indexing and ranking [28]. The searches were conducted on the 7 April 2009 using the following terms: buy + “legal highs” + UK. Results were limited to “pages from the UK” (Google.co.uk) and “United Kingdom” (Altavista.co.uk).

2.1. The sample

The first 100 Websites identified by Google™ and AltaVista™ were fully assessed. A further random sample of 5% of the remaining Websites was assessed. Random numbers were generated using an online Research Randomizer programme, accessed at www.randomizer.org [30].

2.2. Screening

Results from both searches were screened for adherence to inclusion criteria. Results were pooled and duplicate entries removed. A second screen was applied and the remaining Websites were subjected to a detailed analysis.

2.3. Inclusion criteria

- Websites selling “legal highs” to the UK public (wholesalers were excluded).
- Websites “based” in the UK (as determined by the following: Website domain extension of “.co.uk”, UK customer services address or phone number, pricing of products in British pounds, local shipping rates to UK addresses).

2.4. Data collection

Websites included in the study were subjected to a detailed analysis over an 11-week period from April 2009 to June 2009. Data on each product was collected and included name, list price, claimed ingredients, claimed effects, dosage instructions, recommended route of ingestion and safety information (side effects, contraindications or drug interactions)

2.5. Analysis and ethics

Data was collected using a specifically designed Excel spreadsheet. A descriptive analysis was conducted using SPSS version 14. This project was granted ethical approval by the University College London Research Ethics Committee (Reference 1728/001).

3. Results

The Google™ and AltaVista™ searches returned a combined total of 1486 results (see Fig. 1). A purposeful sample of 264 results was selected as described in the methodology. 115 results (43.5%) met the inclusion criteria for the study. Google™ and AltaVista™ had equal numbers of valid results (58, 57 respectively). After controlling for duplicate entries and multiple web addresses representing the same business, the final number of individual legal high retailers was 39.

3.1. Availability

UK online legal high retailers were easy to locate using standard Internet search engines and occupied 17 (85%) of the top 10 ranked results for both search engines.

3.2. Products

The retailers offered a total of 1308 items for sale with an average of 16 per site (Range 3–168). A further analysis of specific product names revealed 346 unique products. This may be an underestimate as several producers make products of the same name and only 44.8% of products listed a manufacturer.

The average price per product was 9.69 British Pounds (SD 6.20, Range 1.75–54.99). Products were available in a variety of formulations. Of the total products, 46.6% (609) were pills or tablets, 29.7% (389) were smoking blends, 18.1% (237) were a single plant material or single plant extract, 3.7% (48) were powders, 1.2% (16) were liquids, 0.4% (5) were orodispersible strips, and 0.2% (3) were chewing gum. The top 25 products (by frequency) are displayed in Table 1.

Products were designed to be administered/ingested by a variety of routes. 58.8% (769) were designed to be swallowed (as

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