The off-prescription use of modafinil: an online survey of perceived risks and benefits

Rachel Teodorini, Nicky Rycroft and James Smith-Spark

Centre for Addictive Behaviours Research

London South Bank University, UK

Acknowledgements

Background and Rationale

- Modafinil: a waking drug
  - Prescribed for narcolepsy, sleep apnea and shift-work sleep disorder
  - Off-prescription use of modafinil for cognitive enhancement
  - One of the most commonly used CEDs off-prescription (Dubljević & Ryan, 2015)

- Laboratory studies (Gilleen et al., 2014; Iked et al., 2017; Muller et al., 2004)
  - Attention
  - Alertness
  - Working memory

- Mood enhancing effects (Price & Taylor, 2005)

- Strong associations between CED use and illicit drug use (Ott & Biller-Andorno, 2014)
  - Cannabis, cocaine, amphetamines, MDMA

Background and Rationale

- Increasing popularity
    - One in ten Cambridge University students reported using CEDs including modafinil (Lennard, 2009).
    - One in five Oxford University student reported using modafinil (Young-Powell & Page, 2014)

- Available from online pharmacies & dark web

- Risks and harms of off-prescription use
    - Unknown quality
    - Drug interactions
    - Safe dosage level
    - Dependency

Aims

- To understand
  - The modafinil user's profile - demographics
  - Motivations for using modafinil
  - Level of dependency

- To investigate the modafinil users' perceived experiences of the drug (both positive and negative) and how this relates to frequency of use.

- To investigate the psychiatric status of modafinil users

- To investigate illicit drug use by modafinil users

Methods

- Anonymous online survey advertised on forum sites

  - Reddit, Bluelight & The Student Room

- Modafinil use

  - Positive & negative effects
  - Dosage
  - Motivations
  - Frequency of use
  - Dependency

Methods

Positive effects	Negative effects
Increased energy	Insomnia
Ability to focus	Anxiety
Motivation	Diarrhoea
Alertness	Nausea
Increased productivity	Headache
Increased concentration	Fast heart beat
Enhanced mood	Indigestion/acid refulx

Design

5 X 2 x 2 Mixed design

- One Between-group factor:

  Frequency of modafinil use

  5 levels: every day

             3 or more times/week

             once or twice/week

             2 or 3 times/ month

             6 times or less a year

- Two Within-group factors:

  Timeframe (*not reported here*)

  Perceived effects

  2 levels: positive

             negative

Results – Demographics

- 219 reported modafinil users
- 73% employed (46% full-time, 27% part-time)
- 86% male
- Mean age 27 years (SD = 9.85)
- American (36% (N=73) or British (27% (N=54)
- 64% university educated (43% undergraduate, 21% post-graduate)
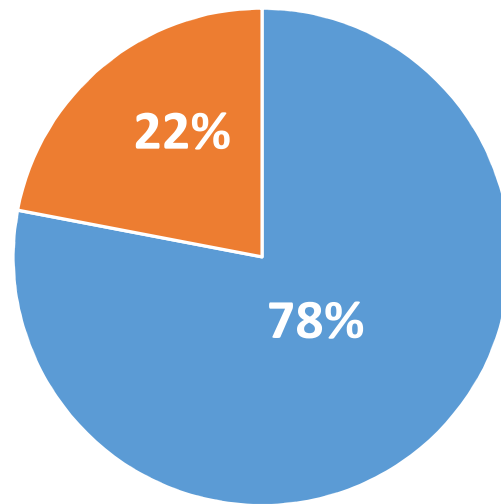- 43% currently studying for a degree

Results

Motivations for use

MOTIVATION	%	N
"Attention/ focus"	84	183
"To get more done"	78	169
"To think more clearly"	55	120
"To work longer hours"	54	119

- **Reported dependency** 6%

Results

Psychiatric Diagnosis

- 22%
- 78%

■ no reported diagnosis

■ reported diagnosis

Results – Frequency of use & perceived risks and benefits

Frequency of modafinil use	N (%)*	Mean (SD) overall number of effects**
Every day	26 (11.90)	4.39 (0.27)
Three or more days per week	66 (30.10)	3.68 (0.17)
Once or twice per week	52 (23.70)	3.70 (0.19)
Two or three times per month	38 (17.40)	3.17 (0.22)
Six times or less per year	37 (16.90)	2.27 (0.22)

*Percentages relate to the no. of respondents within each category of usage frequency

**Effects are collapsed across timeframe and perceived effects, therefore the mean overall number of effects are not whole numbers.

Results – cont.

- Main effect of frequency of modafinil use on number of effects reported,
- $F_{(4, 214)}$ = 6.91, *MSE* = 7.42, *P*<.001, η_p^2= .114)

- Compared with usage at 6 times or less per year, respondents reported significantly more effects with usage once or twice per week (*p* = .010), three times or more per week (*p* = .007) and every day (*p*< .001).

- A significant difference in the number of effects reported between reported usage two or three times per month and reported usage every day (*p* = .006).

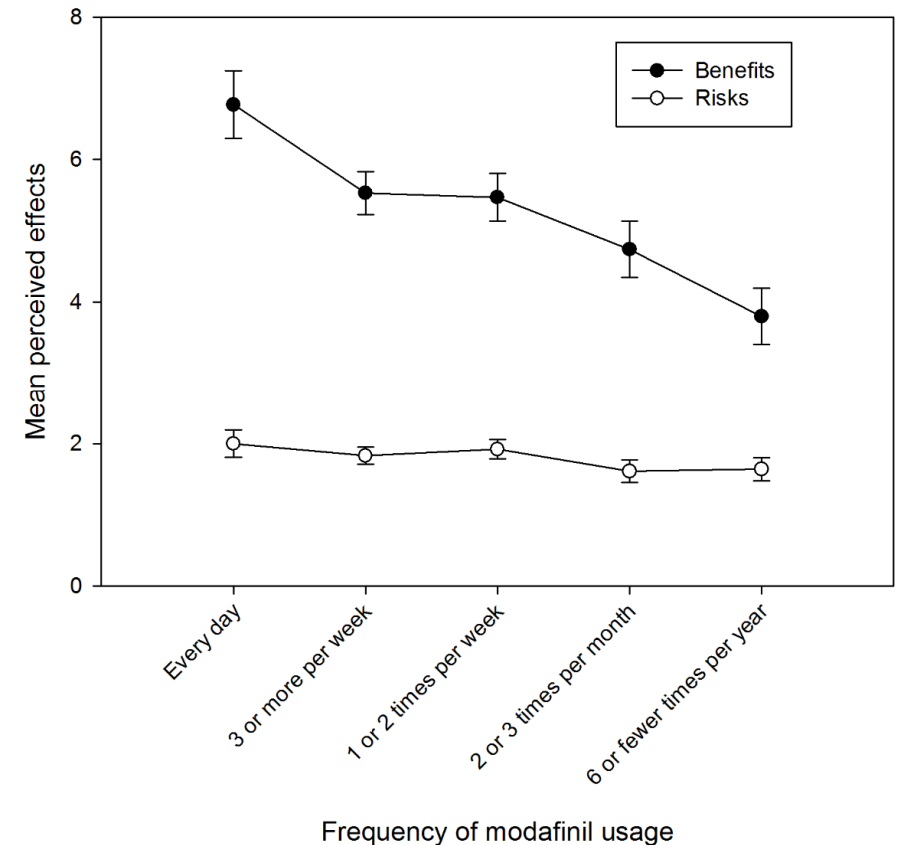# Results – Frequency of use & perceived risks and benefits

- Main effect of perceived benefits & risks on modafinil use

  ($F_{(4, 214)}$ = 379.3, *MSE* = 6.264, *p* < .001, η_p^2 =.639).

  Respondents reported

  more benefits (mean = 5.26, SE = 0.17)

  than risks (mean = 1.80, SE = 0.07).

Results cont.

Illicit drug use

	CANNABIS Lifetime %	COCAINE Lifetime %	AMPHETAMINES Lifetime %	MDMA Lifetime %
Current study	83	41	46	47
EMCDDA EU (2019)	27	5	4	4
EMCDDA UK (2017)	30	11	10	10
NIDA 12yrs or older	44	15	8	7

EMCDDA: European Monitoring Centre for Drugs and Drug Addiction
NIDA: National (USA) Institute on Drug Abuse (2014)

Conclusions and Implications

- Profile of modafinil user: mostly male, American or British, educated, employed and in their mid to late 20s.

- Although reported dependency is low, the link between perceived benefits and frequency of use suggest there may be the potential for dependency to develop over time.

- As reported frequency of modafinil use increased, the number of perceived benefits increased whilst the number of negative effects remained stable and unchanged.

- Tentative link between reported modafinil use and reported presence of psychiatric disorders, mostly depression and anxiety.

- There is a pattern of illicit drug use associated with modafinil use.