

Introduction

- Approximately 50% of patients do not take their medications as instructed. Factors contributing to poor medication adherence are complex and varied¹.
- Pharmacophobia is defined as an irrational fear of pharmacotherapy, which can lead to improper or absence of medication consumption, worsening or relapse of disease, and poor quality of life. Pharmacophilia is described as the urge to use therapeutics more than necessary, which can lead to abuse, overuse, or addiction^{2,3}.
- Pharmacophobia and pharmacophilia have mainly been investigated for antipsychotic medications³⁻⁵, but less is known related to medications for pain^{2,6}.
- Skewed medication adherence for analgesic use, can be accordingly classified as analophobia and analophilia. Information is limited about prescribed and over-the-counter analgesics.

¹ Brown MT, Bussell JK. Medication adherence: WHO cares? *Mayo Clin Proc.* 2011 Apr;86(4):304-14.
² Gazerani P. Pharmacophobia and pharmacophilia in analgesic use. *Pain Manag.* 2017 Sep;7(5):341-344.
³ Sibitz, I, Katschnig, H, Goessler, R, Unger, A, Amering, M. Pharmacophilia and pharmacophobia: determinants of patients' attitudes towards antipsychotic medication. *Pharmacopsychiatry* 2005; 38:107-112.
⁴ Petelinšek A, Lauri Korajlija A. Predictors of pharmacophobia. *Health Psychol Res.* 2020 May 26;8(1):8853.
⁵ De Las Cuevas C, Peñaite W. Explaining pharmacophobia and pharmacophilia in psychiatric patients: relationship with treatment adherence. *Hum Psychopharmacol.* 2015 Sep;30(5):377-83.
⁶ Husain TA, Ahmed HF, Mabooos M, Gul S. Pharmacophilia: prevalence and trends in our community. *W. J. Pharmaceut. Sci.* 2(4), 346-349 (2014).

Aims

- The purpose of this study was to identify analophobia and analophilia among college and university students in Norway using over-the-counter painkillers.
- It was also expected to find possible reasons for attitudes towards being analophobic or analophilic.
- The ultimate goal was to find out where the skewed attitude is, and consequently to find effective measures that can prevent such attitudes.

Methods

Subjects

- College and university students (18-30 years) in Norway were defined as the study target population.

Design

- A cross-sectional survey-based study was conducted in Spring 2021.

Tools

- An online questionnaire was designed to collect information about socio-demographic characteristics and attitudes towards the use of over-the-counter analgesics.

Statistical analysis

- Statistical analyses were performed by the aid of Chi-square test, independent *t*-tests, and linear regression. Data handling and analyzes were performed using Microsoft Excel, and SPSS.

1. Questionnaire

- Inspiration^{7,8} was taken from the Hogan Drug Attitude Inventory (DAI) and the Pain Medication Attitudes Questionnaire (PMAQ) and a Norwegian questionnaire was designed by aid of web platform provided by the University of Oslo.
- 2 pilot tests were conducted before the final version was made that took > 10 min to complete.
- The questionnaire was designed online, voluntary and anonymous to save time, and reaching out to a large population through the social media platforms.
- The questionnaire consisted of 2 parts:
 - socio-demographic questions and general questions about the use of over-the-counter painkillers (15 questions).
 - 19 allegations about attitudes towards over-the-counter painkillers in connection with analophobia and analophilia.
- The allegation statements addressed fears of drugs, side effects, knowledge, reliance on drugs and conspiracy theories.
- The allegation statements were divided into 3 categories: 11 analophobic, 7 analophilic, and 1 neutral statement.
- The respondents were not informed about categories, and the statements were placed in random order.

⁷ McCracken LM, Hoskins J, Eccleston C. Concerns about medication and medication use in chronic pain. *J Pain.* 2006 Oct;7(10):726-34.
⁸ Hogan TP, Awad AG, Eastwood R. A self-report scale predictive of drug compliance in schizophrenics: reliability and discriminative validity. *Psychol Med.* 1983 Feb;13(1):177-83

2. Allegation Statements

Overview of categories for different statements in the questionnaire related to analgophobic, analophilic or neutral statements

ANALGOPHOBIC STATEMENTS	
1. I believe that over-the-counter painkillers will help with my pain	
2. I found over-the-counter painkillers dangerous.	
3. I'm worried about the side effects of over-the-counter painkillers.	
4. I'm afraid of becoming addicted if I use over-the-counter painkillers for a long time.	
5. I'm afraid the drug will stop working if I use it for a long time	
6. I believe that over-the-counter painkillers hurt me more than good.	
7. I am worried that others will see that I use over-the-counter painkillers.	
8. I would rather feel bad than take over-the-counter painkillers.	
9. I am afraid that my body will be harmed by over-the-counter painkillers.	
10. I believe that the sale of over-the-counter painkillers is just marketing for the pharmaceutical industry to make money.	
11. The pharmaceutical industry gives us harmful treatments without patients' consent to keep people sick and increase drug sales.	
ANALGOPHILIC STATEMENTS	
12. I'm addicted to over-the-counter painkillers.	
13. I take over-the-counter painkillers preventively when I know I'm going to get pain.	
14. I am afraid to stop taking over-the-counter painkillers because it will make me sick.	
15. I fear that I will run out of over-the-counter painkillers that will help the pain.	
16. I'm afraid of performing worse on exams without over-the-counter painkillers.	
17. I am afraid of performing worse at work, training and / or other social gatherings without painkillers.	
18. I take over-the-counter painkillers to feel more relaxed.	
NEUTRAL STATEMENT	
19. The pharmacy provides good information when buying over-the-counter painkillers.	

3. Scoring

- The degree of analgophilia and analgophobia was measured using a scoring system, with predefined cut-offs. Each statement was scored on a 5-point Likert scale. Strongly agree 5, Somewhat agree 4, Neither agree or disagree 3, Somewhat disagree 2, and Strongly disagree 1 (for statement 1, the opposite was used).
- The maximum score possible on the analgophobic claims was 55 points. It was defined that everyone above 44 points was most likely analgophobic. If a participant received between 34-44 points, the participant showed a tendency to analgophobia, while a score from 0-33 points showed low probability of or no analgophobic behavior (neutral).
- The maximum score possible on the analgophilic claims was 35 points. The respondents who received more than 28 points were expected to be analgophilic (extreme), and a score in the range of 22-28 points indicated analgophilic tendencies towards the use of over-the-counter painkillers. If the respondent received a score below 22 points, he or she had no significant analgophilic tendencies (neutral).

Cut-off values for the analgophobic and analgophilic statements

	Analgophobia (cut-off)	Analgophilia (cut-off)
Extreme	> 44	> 28
Tendency	34-44	22-28
Neutral	<34	<22

Results - Sociodemographic

Of 584 respondents, 572 met the inclusion criteria for analysis:

- 58.6% were between 22-25 years and studied in Oslo (41.7%).
- 31.8% studied a subject within health sciences and lived with others (77%).

Socio-demographic information obtained from the questionnaire with the number of respondents

Socio-demographic information	Respondents, N (%)
Gender:	
- Women	483 (84.4)
- Men	89 (15.6)
- Other	0 (0)
- Total	572 (100)
Age:	
- 18-21 years	211 (36.9)
- 22-25 years	335 (58.6)
- 26-30 years	26 (4.5)
- Total	572 (100)
Place of study:	
- Oslo	236 (41.7)
- Outside Oslo	330 (58.3)
- Total	566 (100)
Living conditions:	
- Lives alone	131 (23)
- Lives with others	417 (77)
- Total	548 (100)
Field of study:	
- Studying health sciences and medicine	182 (31.8)
- Studying other	390 (68.2)
- Total	572 (100)
Study program:	
- Year study	38 (6.7)
- Bachelor's degree	383 (67.2)
- Master's degree	149 (26.1)
- Total	570 (100)

Results – Pain and Analgesic Use

Frequency of pain and consumption of over-the counter analgesics 570 answered

	Frequency of pain N(%)	Consumption of over-the-counter analgesics N(%)
Infrequently	269 (47.2%)	355 (62%)
A couple of times a month	216 (37.9%)	169 (29.5%)
A couple of times a week	58 (10.2%)	30 (5.2%)
Daily	19 (3.3%)	4 (0.7%)
Never	8 (1.4%)	14 (2.4%)

Use of over-the-counter analgesics in the past month and reasons

- 326 of the 572 respondents answered that they used over-the-counter analgesics in the past month. On average, students had used over-the-counter painkillers for 3.4 days in the past month.
- In response to reasons for use of analgesics it was possible to choose more than one option. Some selected "Other", where other reasons were expressed by the participants. Other causes that were then mentioned were drunkenness, toothache and abdominal pain.

Use of over-the-counter analgesics in the past month	N(%)	Reason for use of analgesics	%
1-5 days	282 (88%)	Headache	37
6-10 days	22 (7%)	Menstrual pain	24
11-19 days	11 (3%)	Lifting mood	0.3
20 days or more	6 (2%)	Sleep problems	1.3

Purchase of over-the-counter analgesics (N(%)

In pharmacies	403 (48%)
In a grocery store, Petrol station and / or Kiosk	392 (47%)
Online pharmacies	35 (4%)
Others	1%

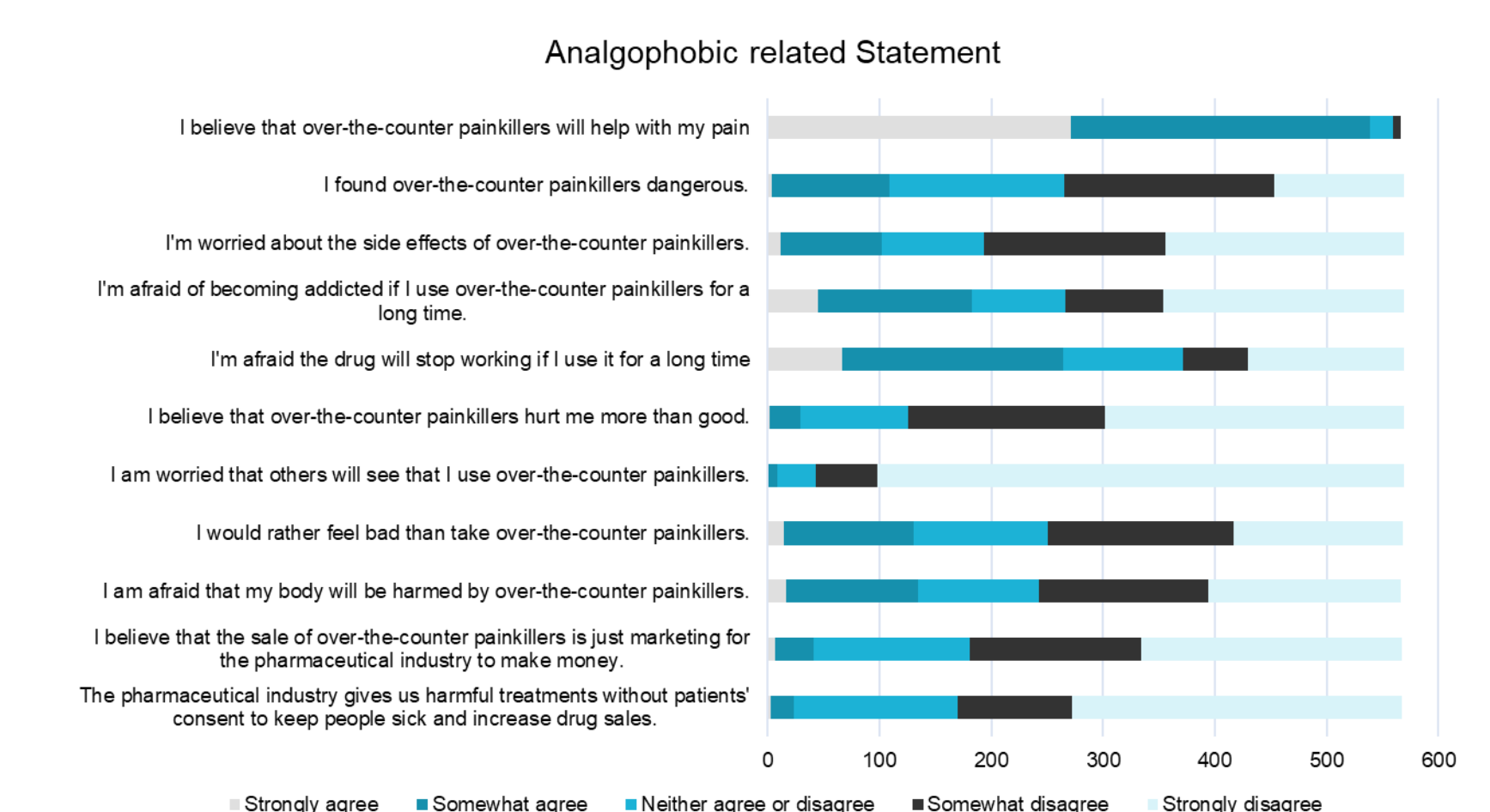
Seven (1%) answered "Other" and wrote, among other things, "Get from home" or "Never bought".

Reading the package information

318 (56%) answered that they read the package "Occasionally", 195 (34%) "Never", and 56 (10%) "Always".

Results – Analgophobia and Analgophilia

Tendencies to analgophobia and analgophilia



Missing data: 0.3%.

- one student (0.2%) was found to be analgophobic, 33 students (5.8%) had analgophobic tendencies, while 538 (94%) students were defined as neutral.
- two students (0.4%) turned out to be analgophilic, 20 (3.5%) students had analgophilic tendencies, while 550 (96.2%) students were defined as neutral.

Results – Regression Analysis

- There was no significant correlation between good information provision in pharmacies and degree of analgophobia.
- There was no significant correlation between providing good information in pharmacies and the degree of analgophilia.
- There was no influence of place of residence, living conditions, gender, and field of study on pattern of analgesic consumption.
- The frequency of pain was correlated with the use of over-the-counter painkillers ($p=0.007$).

Conclusions

- Students in Norway were majorly neutral towards use of over-the-counter analgesics, a non-significant tendency towards analgophobia was observed when analgophobia and analgophilia tendencies were compared.
- Living situation, age, place of study, and field of study had no effect on students' attitudes towards the use of over-the-counter painkillers.