BMJ Open

Does the advertisement in Swiss pharmacy windows rest on evidence-based medicine? An observational study

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ABSTRACT

Objectives The aim of the study was to analyse the proportion of evidence-based medication displayed in pharmacies and compare it between the different linguistic regions of the country, at different times of the year to determine the amount of proven effective medications indirectly recommended to the public in different parts of Switzerland.

Design This is an observational study conducted by medical doctors in the department of internal medicine at the Spitalzentrum Biel, Switzerland.

Setting The observation took place from July 2019 to May 2020. From a total of 1800 pharmacies in Switzerland, 68 different pharmacies were selected across the 3 main linguistic regions and the medication on display in their windows were examined 4 times a year regarding their efficacy. The displays of medication with or without evidence-based efficacy were described using absolute numbers and proportions and compared between the different linguistic regions at different seasons using χ^2.

Participants There were no human or animal participants involved in this study.

Primary and secondary outcome measures The primary outcome is the proportion of medication displayed in pharmacy windows with a proven effectiveness in medical literature. The secondary outcome was the variability of the primary outcome over time (seasonal changes), over the different linguistic regions of Switzerland and between chains and privately owned pharmacies.

Results We examined 970 medications and found that over the whole year, there is a high proportion of non-evidence-based drugs (56,9%) displayed in pharmacies. Swiss German cantons display significantly more non-evidence-based medications in winter. We found no statistical difference for other seasons or between chains and privately owned pharmacies.

Conclusion Pharmacies in Switzerland tend to display significantly more non-evidence-based drugs, thus indirectly recommending them to the public. In a time of necessary expansion of self-medication by the population, this could incite consumers to buy drugs without proven effectiveness.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This is the first study to analyse the proportion of evidence-based medication displayed in pharmacy windows.
⇒ All the studies concerning each medication were reviewed by the whole research team.
⇒ The selected pharmacies were geographically disparate in the three main linguistic regions of Switzerland to reflect possible sociocultural differences.
⇒ Due to logistical limitations, the pharmacy windows were not all photographed on the same day but over a period of 6–8 weeks.
⇒ We did not determine the sample size needed for a statistically significant result before starting with the data collection.

INTRODUCTION

Health products in Switzerland (medicinal products, dietary supplements and medical devices) used to be categorised into five categories, ranging from controlled substances such as opioids and antibiotics requiring a prescription to vitamins and saline solutions sold over the counter (OTC). In 2019, the Swiss law regarding the sale of different health products according to these five categories (A–E[1 2]) was revised with the aim of simplifying the supply by pharmacists of certain health products normally requiring a prescription and provide consumers with a larger selection of OTC medications. Roughly 85% of medication previously available at pharmacies after an evaluation by either a medical doctor or a pharmacist were redistributed into a lower security category and were therefore newly available for over-the-counter purchase without supervision.[3]

The legal definitions of different health products (or medications) as well as their regulation by the Swiss federation are quite

complicated. Broadly, the products sold to consumers can be categorised as follows:[4]

A. Medicinal products (or drugs): products of chemical or biological origin intended or claimed to have a medicinal effect on the human or animal organism, in particular in the diagnosis, prevention or treatment of diseases.
   a. Medicinal products with indications: medicinal products with an officially authorised indication in a specific field of application which are intended for use in accordance with the rules of the medical and pharmaceutical sciences.
   b. Complementary medicines with indications: medicinal products with an officially authorised indication in a specific field, such as homoeopathy, anthroposophical medicine or traditional Asian medicine and whose field of application is determined according to the principles of the corresponding therapy approach.
   c. Dietary supplements.
B. Medical devices: products, including instruments, apparatus, equipment, in vitro diagnostics, software, implants, reagents, materials and other goods or substances which are intended or claimed to have a medical use and whose principal effect is not obtained with a medicinal product.

Before any medicinal product can be imported, advertised and sold in Switzerland, the manufacturing company needs to apply for a licence from SwissMedic, the Swiss drug administration. Conditions for the granting of such a licence include a scientific review of all data concerning manufacturing, safety profile and clinical studies as well as a review of the packaging (including information leaflet) as well as a pharmacovigilance plan.[5] The advertisement of medicinal products is regulated by the Swiss Remedy Law (Heilmittelgesetz) and requires the reference of the disease the drug is to be used for, referral to the drug's package insert and display of the packaging on the advertisement. It is forbidden to advertise a drug for any medical indication not backed by sound scientific data evaluated by the Swiss Medical Board. The advertisement of medicinal products requiring a medical prescription is illegal.[6]

A medical device is any product intended for medical use that is not labelled as a drug, from pacemakers to antibloating or slimming products. Medical devices must be labelled with the letters CE on the package, the visibility of the sign is not specifically regulated. These products also do not undergo an official authorisation procedure by the Swiss Medical Board. For most products, Switzerland has adopted the certification existing in the European Union based on bilateral agreements.[7]

The difference between a medicinal product, a dietary supplement and a medical device is often not immediately visible, and the public is not necessarily aware of the distinction between them. A medicinal product against constipation and a medical device sold for the same indication can be advertised side by side, despite the medical device not necessitating the same rigorous proofing required of a drug. The only distinguishing feature between the two, the mention of the word drug or the letters CE, can be hard for non-professionals to be aware of.

While outright false advertising is forbidden for all medicinal products, dietary supplements and medical devices, implied indications are harder to regulate. Medicinal products, dietary supplements or medical devices with a proven effect for one indication can be sold to the consumer while implying properties for another indication, in which their efficacy is doubtful or even inexistent.[8] An example of this would be magnesium, depending on concentration either a dietary supplement or a medicinal product, which is often advertised in relation with sports, the advertisement listing the bodily functions magnesium is involved in (eg, proper muscle function), thus indirectly implying an effect on those through consumption of the product. When looking at scientific studies regarding the effect of magnesium to prevent or treat muscle cramps; however, there is no statistically significant evidence to confirm this.[9]

At present, there are no data about the percentage of medications with a proven effect by evidence-based medicine (EBM) standards[10] in pharmacy windows and we thought consumers should be made aware of this.

The aim of the study was to analyse the proportion of medications (medicinal products, dietary supplements and medical devices which could be mistaken for a medicinal product) with proven efficacy according to EBM standards in the displays of Swiss pharmacies at different seasons in the three main linguistic regions of the country and thus determine the percentage of medications with a proven efficacy recommended to the public in different parts of Switzerland.

METHODOLOGY
Design and setting
This is an observational study conducted by medical doctors in the department of internal medicine at the Spitalzentrum Biel, Switzerland. The observation took place from July 2019 to May 2020.

Population and sample size
From a total of 1800 pharmacies in operation in Switzerland in January 2019,[11] 68 different pharmacies were selected randomly across the country (online supplemental file 1) and classified according to the 3 main linguistic regions of Switzerland (German-speaking, French-speaking and Italian-speaking region) (online supplemental file 2), and between pro-pharma (cantons where general practitioners can have their own pharmacy and may sell the needed drugs directly to the patients) and non-pro-pharma cantons[12] (online supplemental file 3). There is an equal proportion of independent and chain pharmacies in this study. Pharmacies without front

Table 1	Level of evidence for therapeutic studies
Level of evidence	**Type of evidence**
1A	Systematic review (with homogeneity) of randomised controlled trials
1B	Individual randomised controlled trial
2A	Systematic review of cohort studies
2B	Individual cohort studies (including low quality randomised controlled trial)
3A	Systematic review of case–control studies
3B	Individual case–control study
4	Case series (and poor quality cohort or case–control studies)
5	Expert opinion without explicit critical appraisal or based on physiology bench research

Level of evidence for therapeutic studies adapted from the Centre for Evidence-Based Medicine, http://www.cebm.net.

windows, for instance, in shopping malls, were excluded from the study.

As we did not compare two different groups of medications and did not know what outcome and what influencing factors to expect, we could not predetermine a sample size. However, we collected sufficient data to be able to show statistically significant results.

The names of the medications visible on display were written down and centralised in our database on an Excel table (online supplemental file 4). All medicinal products (drugs) and dietary supplements were included. Beauty products such as soaps, shampoos, deodorants and toothpastes as well as medical devices (eg, splints) were excluded. We chose to only register medications displayed in the pharmacy windows as we were interested in the evidence-level of medication indirectly recommended to the public through this type of advertisement.

Medication classification

To determine whether a medication could be considered as EBM or not, the authors screened different databases (PubMed, Cochrane, UptoDate, Compendium, Google Scholar and others)[13] for publications concerning the active pharmaceutical ingredients (APIs) contained in the different medications displayed. For instance, if a pharmacy displayed five medications in its window, two of which contained the same API, we still registered five displayed medications but regrouped the two generics to one API. For instance, Algifor Forte tablets and Dolo Spedifen tablets are both Non-Steroidal Anti-Rheumatic (NSAR) generics whose API is ibuprofen, so that they were regrouped in one API.

All the publications found on the different databases were combined for each API and reviewed by the whole research team. The level of evidence supporting the efficacy of each medication was determined according to existing EBM categories,[10 14] defined by the Centre for Evidence-Based Medicine (CEBM) and listed in tables 1 and 2.

Table 1 shows existing levels of evidence defined by the CEBM while table 2 shows Grading of Recommendations Assessment, Development and Evaluation (GRADE)

levels. EBM evidence levels are based on the type and quality of clinical studies confirming the security and effectiveness of a medical practice or guideline. GRADE levels are meant to tell health providers how definitive and certain a specific guideline or recommendation is based on EBM evidence levels.

For this study, the two internationally used grading systems (EBM and GRADE) were combined into an original grading system composed of five categories described in table 3. The categories created for this study aim to reflect these internationally recognised guidelines. Depending on the EBM and GRADE levels of each API, the medications were classified into these five new categories.

Medications classified in categories 1 and 2 were considered as evidence based, those classified in categories 3, 4 and 5 as non-evidence based. Since the GRADE levels consider medications with only one randomised control trial (RCT) or several peer-reviewed studies to be of moderate evidence level, category 3 was classified as non-evidence based, since more studies might very well impact the confidence in the effect of those medications.

For all the displayed medications with visible information or advertisement for a treatment indication, we classified the medication according to this indication, whereas for those without information on the display we classified them according to the indication given by the Swiss compendium.[15] To continue with our previous example of magnesium, we used the implied indication of muscle cramps or restless legs treatment, for which there is no evidence and would thus classify the medication in category 5, instead of the indication of hypomagnesaemia indicated in the Swiss compendium which would warrant a category 1.

To give a further example of the classification according to EBM and GRADE levels as well as the medication categories in this study, ibuprofen has been shown in various RCTs to have a statistically significant effect on pain levels, warranting an EBM level 1A. Accordingly, the GRADE level is A. Given several high-quality RCTs and a high evidence level, ibuprofen and other non-steroidal anti-inflammatory drugs were classified as a category 1 in this study.

Table 2 GRADE practice recommendation

Code	Quality of evidence	Definition	Implications for practice
A	High	Further research is very unlikely to change our confidence in the estimate of effect. ▶ Several high-quality studies with consistent results ▶ In special cases: one large, high-quality multicentre trial	Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present
B	Moderate	Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate. ▶ One high-quality study ▶ Several studies with some limitations	Generally, clinicians should follow a recommendation but should remain alert to new information and sensitive to patient preferences
C	Low	Any estimate of effect is very uncertain. ▶ One or more studies with severe limitations	Clinicians should be flexible in their decision-making regarding appropriate practice, although they may set bounds on alternatives; patient preference should have a substantial influencing role
D	Very low	Any estimate of effect is very uncertain. ▶ Expert opinion ▶ No direct research evidence ▶ No systematic empirical evidence ▶ One or more studies with very severe limitations	Clinicians should consider all options in their decision-making and be alert to new published evidence that clarifies the balance of benefit versus harm; patient preference should have a substantial influencing role

GRADE Working Group 2007 (modified by the EBM Guidelines Editorial Team).
GRADE, Grading of Recommendations Assessment, Development and Evaluation.

Observation procedure

The window display of each selected pharmacy was photographed four times a year (once between July and August 2019, once between October and November 2019, once between the end of December 2019 (after Christmas) and January 2020, and once between April and May 2020). There are four seasons in Switzerland, and certain illnesses are more typical for some seasons than others (eg, common cold in autumn and winter, hay fever in spring, sports injuries in summer). We tried to capture the changes in promoted medications according to the change in seasonal weather and related illnesses. The pharmacist or pharmacy owners were not involved in the design or execution of the study and were not informed the photographs were being taken.

Statistical analysis

According to their level of evidence, the displayed medications were described using absolute numbers and proportions, and compared between the different linguistic

Table 3 Medication categories

Category	Quality of evidence	Definition
1	High evidence	▶ At least one meta-analysis or ▶ Several placebo-controlled double-blind randomised control trials
2	High to moderate	Medication with several active pharmaceutical ingredient of which at least one fulfils the definition for category 1: ▶ At least one meta-analysis or ▶ Several placebo-controlled double-blind randomised control trials
3	Moderate	▶ Only one placebo-controlled double-blind randomised trial or ▶ Several peer-reviewed studies
4	Moderate to low	Medication with several active pharmaceutical ingredient of which none fulfil the definition for category 1
5	Low to very low	▶ One or more studies with severe limitations ▶ Expert opinion ▶ No direct research evidence

Medication categories in our study adapted from CEBM evidence levels and GRADE levels.
CEBM, Centre for Evidence-Based Medicine; GRADE, Grading of Recommendations Assessment, Development and Evaluation.

Table 4 Medications per season and level of evidence

	Category 1	Category 2	Category 3	Category 4	Category 5	Total medications per season
Summer	97	33	35	15	114	294 (30.4%)
Autumn	68	9	27	24	103	231 (23.8%)
Winter	63	27	26	16	92	224 (23%)
Spring	113	8	18	15	67	221 (22.8%)
Total medications per level of evidence	341 (35%)	77 (8%)	106 (11%)	70 (7,2%)	376 (38,8%)	970

All displayed medications according to season and level of evidence.

regions, pro-pharma and non-pro-pharma cantons and management type at different seasons using χ^2. All statistical analyses were performed by using STATA V.16.

Patient and public involvement
No patients were involved.

RESULTS
Of the 68 selected pharmacies, 31 were in the French-speaking region, 5 in the Italian-speaking region, 32 in the German-speaking region of Switzerland, 31 in pro-pharma cantons, 37 in non-pro-pharma cantons, respectively. Thirty-one were privately owned pharmacies, 37 belonged to chains.

We photographed a total of 987 medications on display, corresponding to 190 different APIs. Of those 987 medications, 17 met exclusion criteria being more cosmetic products than medications (online supplemental file 5). The remaining 970 medications (166 different APIs) (online supplemental file 1) are regrouped in table 4 according to season and level of evidence.

Overall, there is a higher amount of non-evidence-based drugs compared with evidence-based drugs (552 (56.9%) vs 418 (43.1%)) displayed in Swiss pharmacy showcases over the whole year. When analysed by season, we found that in autumn, 66.7% of the displayed drugs where non-evidence-based drugs, followed by winter with 59.8% and summer with 55.8% (online supplemental file 6). In spring, the tendency was reversed, with 54.7% of drugs displayed being evidence based. This was due mainly to the large number of antiallergic medication on display in the springtime, highly effective antihistaminic drugs being available OTC, thus allowing their advertisement.

We found no statistically significant difference between the different linguistic regions over the whole year (p=0267). When analysed according to linguistic regions for the different seasons, we found that pharmacies in the Swiss-German cantons displayed significantly less evidence-based medication than their counterparts in the French-speaking or the Italian-speaking cantons in winter (55 non-EBM vs 11 EBM in Swiss-German cantons; 12 vs 12 in Italian-speaking cantons; 67 vs 67 in French-speaking cantons; p=0,0001) (figure 1). During the rest of the seasons, there was no statistically significant difference in the proportion of evidence-based medications displayed between the three linguistic regions of Switzerland.

We found no statistically significant difference in evidence-based medication displayed between pro-pharma and non-pro-pharma cantons (pro-pharma 172/406 (42.4%) vs non-pro-pharma 246/564 (43.6%) evidence-based medications on display, p=0698) (online supplemental file 7). Similarly, we found no difference in evidence-based medication display between chains and privately owned pharmacies (chains 248/576 (43%) vs privately owned pharmacies 170/394 (43.2%) evidence-based medications on display, p=0.977) (online supplemental file 8).

DISCUSSION
Self-medication has steadily risen in recent years, partly in response to rising healthcare costs and partly through the growing realisation of the population of their responsibility for a more active role in their own health. People's health literacy, however, remains low, a knowledge gap preventing some from actively participating in their own health management and leading others to self-medicate with a lack of understanding of the potential risks.[16] Self-medication is defined by the WHO as 'the selection and use of medicines by individuals to treat self-recognised illnesses or symptoms'. This means that a growing part of the population is seeking to treat symptoms without understanding where these might come from.

Because of the expansion of the list of OTC medication and the increase in their advertising, self-medication is being promoted everywhere. Self-medication can have a tremendously positive impact on healthcare, especially on the costs, through a decrease of doctors' visits and time away from work for those visits as well as decrease of unnecessary prescription drugs.[17] However, there are risks too. Considering the low health literacy even in highly developed nations, the understanding of human health, bodily functions and illnesses is not high enough to allow a reliable complete self-diagnosis, let alone management of medication intake. In emerging and low/middle-income countries, inappropriate self-medication
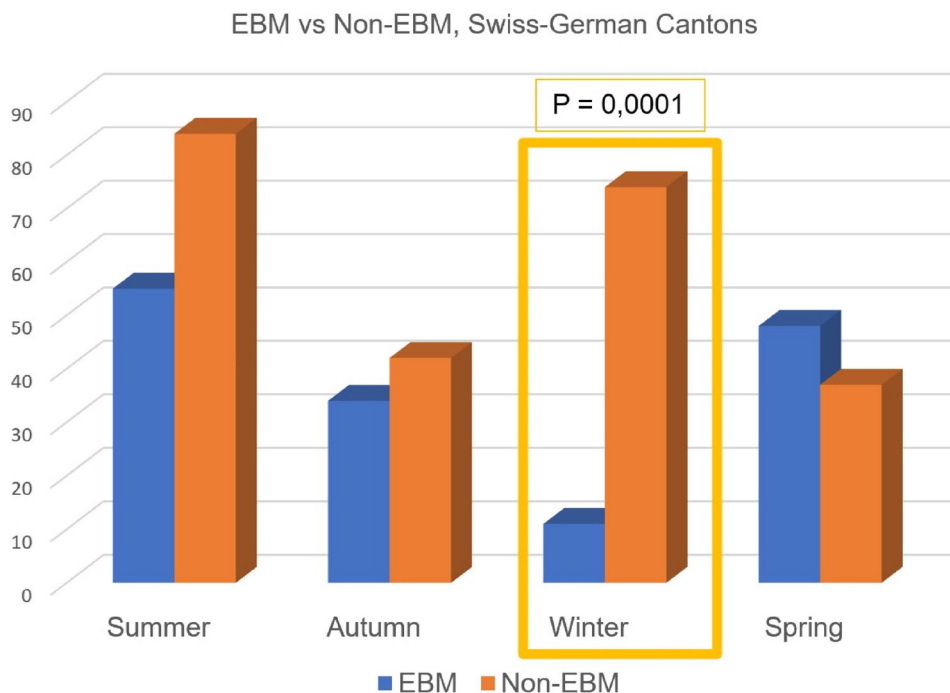
EBM vs Non-EBM, Swiss-German Cantons

Figure 1 EBM versus non-EBM medication in Swiss-German cantons. Swiss-German cantons display significantly less evidence-based medications than their counterparts in the French-speaking or Italian-speaking cantons (p=0.0001). EBM, evidence-based medicine.

with OTC drugs has been shown to lead to a multitude of adverse effects, such as dangerous drug resistance (particularly to antibiotics) and allergies.[18–20] In industrialised nations, polypharmacy is the most worrisome aspect, with patients often unaware that OTC drugs can interact with their prescribed drugs or contain similar APIs, leading to adverse effects through interactions or overdosage.[21]

Through misleading advertisement and greater access to OTC drugs, the general population is encouraged to treat itself for minor ailments. Minor ailments, however, is a relative term, and what would be considered an emergency by some can be considered minor by others. This could potentially prevent patients from seeking adequate care for too long while they try to help themselves with unproven treatments. With more and more people self-medicating and a high proportion of questioningly effective drugs being advertised in pharmacies and not necessitating any type of professional evaluation to be bought, the risk for adverse effect is high.[22]

How can we improve this delicate situation? The authors believe that, to avoid adverse effects and unnecessary treatment, patients should be encouraged to expand their health literacy and understand their bodies and symptoms better. Contrarily to current policies, self-medication should not be promoted so swiftly as long as this flaw in people's education has not been addressed. While this intervention would be the most efficient, it is unrealistic to expect governments to fund any health literacy programmes in a time of economic recession. Another approach would be to clearly mark all shelves containing OTC drugs and attract patients' attention to the fact that herbal remedies and other OTC drugs can

have adverse effects and interactions with existing treatments. In addition, a label on all medications sold OTC showing their level of evidence (just as electrical appliances have been rated from A to F according to their level of energetic efficiency to promote buying less wasteful appliances) would allow patients to make informed decisions about the medications they choose to buy.

As a side note, we found that as the seasons progressed, less and less medications were put on display, but most pharmacies displayed not only medications or cosmetic products but also sound medical advice, recommendations for vaccinations (eg, for influenza or tickborne encephalitis) and others, which we consider an invaluable contribution to primary medical care but could not be analysed concomitantly to the drugs investigated in this study.

We have not found any study like our own when databases were researched for pharmacy, displays, windows, evidence based, efficacy, drugs, medication, marketing, OTC.

Several studies researched the link between in-store counselling in pharmacies and self-medication,[23] and some others analysed the public health impact of pharmacies regarding health services provided.[24] Jokinen *et al* mainly analysed the impact of services provided by pharmacies, such as blood pressure measurements, blood sugar levels, medication review or smoking-cessation counselling, as well as the product marketing strategy of non-prescription drugs in these pharmacies. Their aim was to determine what factors might influence public health orientation and product marketing orientation between different pharmacies in Finland. Contrarily to

our findings, they recorded a significantly higher product marketing orientation in large pharmacies belonging to chains as well as in pharmacies located close to rivals. However, they did not analyse whether the efficacy of the advertised medication was evidence based. It would also be quite interesting to have more studies like our own from other European countries where the law regarding advertisement for medications and the classification of which medication is available OTC or requires a prescription might be different. This might show other factors impacting displayed medications.

When judging the marketing of products considered non-evidence based, we need to remember that even evidence-based drugs were rated following RCTs most often funded by the pharmaceutical industry, these studies and publications being an important part of their marketing strategy as well.[25] Producers of herbal remedies or alternative medicines such as anthroposophical or homeopathic medicines quite often do not have the funds to conduct large scale RCTs.

CONCLUSION

When analysed over the whole year, the efficacy of 56.9% of medication on display in pharmacies in Switzerland is not proven according to EBM standards. When analysed according to season and linguistic region, pharmacies in Swiss-German cantons displayed significantly more non-evidence-based drugs than pharmacies in the French-speaking region or the Italian-speaking region of Switzerland. There was a surge of evidence-based medication on display in spring, mostly antihistaminic drugs, and non-steroidal analgesics.

With this tendency to display significantly more non-evidence-based drugs, pharmacies indirectly recommend them to the public. In a time of necessary expansion of self-medication by the population, this could incite consumers to buy and use drugs without a proven effectiveness.

Limitations

For logistical reasons, the pharmacies were not evenly distributed in the whole country, several regions of Switzerland were thus not analysed, and the results of the study might not be applicable there (for instance eastern Switzerland). Similarly, our sample of 68 pharmacies out of 1800 might limit the applicability of the results to the regions that were not analysed.

Another impact of logistics was that the pharmacy windows were not all photographed on the same day but over a period of 6–8 weeks by different people. This could impact the type of drugs being advertised, with pharmacies changing their window display more regularly than four times a year. However, by photographing these windows during the middle of each season, we hope to have caught the most representative displays of drugs for each one.

Another point was that the medications on display are to a certain degree regulated by the pharmaceutical industry and not necessarily by the pharmacists working there, independently of the store being privately owned or not.[26]

Given the complexity and specificity of the advertisement regulations and of the jargon (Arzneimittel vs Medizinprodukt), translations to English tend to be difficult as well and we have not been able to find any studies analysing this uniquely Swiss categorisation problem and the Swiss population's awareness of the issue.

As we did not compare two different groups of medications and did not know what outcome and what influencing factors to expect, we could not predetermine a sample size. However, we collected sufficient data to be able to show statistically significant results.

Lastly, the emergence of the SARS-CoV-2 virus between February and March 2020 may also have influenced the products put on display in Swiss pharmacies. Since we only analysed the window display over 1 year and do not have a comparative in April of 2019, we cannot conclusively know either way.

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REFERENCES

1. Abgabekategorien von Arzneimittel. Pharmasuisse. 2019. Available: https://www.pharmasuisse.org/data/docs/de/9087/Abgabekategorien-von-Arzneimitteln.pdf?v=1.0 [Accessed Jun 2023].
2. Mitteilung von Swissmedic Bezüglich Umteilung der Abgabekategorien. 2018. Available: https://www.swissmedic.ch/swissmedic/de/home/news/mitteilungen/hmg2-umteilung-arzneimittel-abgabekategorie-c.html [Accessed Jun 2023].
3. Simplified provision of list B medicinal products. 2023. Available: https://www.bag.admin.ch/bag/en/home/medizin-und-forschung/heilmittel/abgabe-von-arzneimitteln.html#815451004 [Accessed Jun 2023].
4. Federal act on medicinal products and medical devices. 2022. Available: https://www.admin.ch/opc/de/classified-compilation/20002716/index.html [Accessed Jun 2023].
5. Legislation governing therapeutic products in Switzerland. 2023. Available: https://www.fedlex.admin.ch/eli/cc/2018/588/de
6. Werbung Für Arzneimittel, Medizinprodukte, Nahrungsergänzungsmittel und Kosmetika des Schweizer Drogenverbands. 2019. Available: www.drogoserver.ch/deutsch/Kommunikation/Werberichtlinien/Werbevorschriften_d_LR.pdf [Accessed Jun 2023].
7. Regulation of medical devices. Swissmedic; 2019. Available: https://www.swissmedic.ch/swissmedic/en/home/medical-devices/regulation-of-medical-devices.html [Accessed Jun 2023].
8. Mansfield PR. Banning all drug promotion is the best option pending major reforms. *J Bioeth Inq* 2005;2:75–81.
9. Cochrane Neuromuscular Group, Garrison SR, Korownyk CS, *et al*. Magnesium for Skeletal muscle cramps. *Cochrane Database Syst Rev* 2020;2020.
10. Burns PB, Rohrich RJ, Chung KC. The levels of evidence and their role in evidence-based medicine. *Plast Reconstr Surg* 2011;128:305–10.
11. Fakten und Zahlen Schweizer Apotheken. Jahresbericht by Pharmasuisse. 2019. Available: https://www.pharmasuisse.org/data/docs/de/37927/Fakten-und-Zahlen-2019.pdf?v=1.0 [Accessed Jun 2023].
12. Argumentarium Ärztliche Medikamentenabgabe, Ärzte MIT Apotheken APA. 2019. Available: https://www.patientenapotheke.ch/userdata/03%20Facts%20and%20Figures/3.3%20Argumentarium/3.3.1-ausfuehrliches-argumentarium.pdf [Accessed Jun 2023].
13. Pubmed (NIH.Gov) (04/2021); Cochrane reviews | Cochrane library (04/2021); search - Uptodate (04/2021); Google scholar (04/2021);
14. Essential Evidence Plus. Levels of evidence. 2007. Available: https://www.essentialevidenceplus.com/product/ebm_loe.cfm?show=grade [Accessed Jun 2023].
15. Swiss medical compendium Website. Available: https://www.compendium.ch/ [Accessed Jun 2023].
16. The health-economic benefits of self-care in Europe. 2020. Available: https://assets.gskstatic.com/corporate/Health-Economic-Study/GSK_report_summary-FINAL.pdf [Accessed Jun 2023].
17. The case for self-care and over-the-counter medicines: value-add to health care and productivity for employees and employers. 2016. Available: https://www.shrm.org/ResourcesAndTools/hr-topics/benefits/Documents/IHPM_self-care_lores.pdf [Accessed Jun 2023].
18. Bennadi D. Self-medication: A current challenge. *J Basic Clin Pharm* 2013;5:19–23.
19. Chautrakarn S, Khumros W, Phutrakool P. Self-medication with over-the-counter medicines among the working age population in metropolitan areas of Thailand. *Front Pharmacol* 2021;12.
20. Tesfamariam S, Anand IS, Kaleab G, *et al*. Self-medication with over the counter drugs, prevalence of risky practice and its associated factors in pharmacy outlets of Asmara, Eritrea. *BMC Public Health* 2019;19:159.
21. Adverse reactions to self-medication: is self-care effective [Focus Farmacovigilanza]. 2014. Available: https://www.pharmaco-vigilance.eu/content/adverse-reactions-self-medication-self-care-effective [Accessed Jun 2023].
22. Montastruc J-L, Bondon-Guitton E, Abadie D, *et al*. Pharmacovigilance, risks and adverse effects of self-medication. *Therapie* 2016;71:257–62.
23. Kamat VR, Nichter M. Pharmacies, self-medication and pharmaceutical marketing in Bombay, India. *Soc Sci Med* 1998;47:779–94.
24. Jokinen L, Puumalainen I, Airaksinen M. Factors associated with health service orientation and active product marketing orientation in Finnish community pharmacies: a nationwide study among private Pharmacy owners. *BMC Health Serv Res* 2020;20.
25. Spielmans GI, Parry PI. From evidence-based medicine to marketing-based medicine: evidence from internal industry documents. *Bioethical Inquiry* 2010;7:13–29.
26. Marketing in pharmacy. 2016. Available: https://pathofscience.org/Library/MMPh_Part_II.pdf [Accessed Jun 2023].