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SELF-MEDICATION PRACTICES AMONG UNDERGRADUATE HEALTH SCIENCE STUDENTS

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Abstract

Self-medication is common among students of medicine, pharmacy, dentistry, nursing and allied health courses, yet their training does not reliably protect them from its hazards. This narrative review brings together published surveys and reviews on how often undergraduate health science students self-medicate, which drugs they choose, why they do it and what harm can follow. Analgesics, antipyretics and antibiotics dominate the reported lists, and mild, self-limiting symptoms are the usual trigger. Clinical exposure raises confidence more than it improves practice. The article reports no new data. Differences in definitions, recall periods and questionnaires limit comparison between studies, and few interventions have been evaluated in this population.

1. INTRODUCTION

The World Health Organization describes self-medication as the selection and use of medicines by individuals to treat self-recognised illnesses or symptoms, and it places the practice inside the wider idea of self-care [1, 2]. Used sensibly, it relieves pressure on busy clinics and lets people deal with a headache or a blocked nose without a consultation [3, 4]. Used carelessly, it brings wrong diagnoses, delayed care, masked disease, interactions and a steady contribution to antimicrobial resistance [4, 5]. The balance between the two depends largely on what the person knows, and that is the reason students of health professions attract so much research attention. In practice the boundary between the two is thin, because the same act, buying a packet of tablets for a familiar complaint, can be sensible in one week and hazardous in the next if the symptom has changed character. Guidance therefore stresses informed choice, a limited duration of use and a clear point at

which to seek review [1, 6].

A student of pharmacy or medicine might be expected to behave differently from the general public. They learn drug names early, can read a package insert and often have a relative or a senior who will answer a quick question. Reports from several countries suggest the opposite pattern: knowledge makes students more willing to treat themselves, not less [7, 8, 9]. Part of this is simple convenience. Hostel life, long timetables and free access to a dispensary or a friend's cupboard make a trip to a doctor feel like an unnecessary cost in time. Part of it is a belief, sometimes justified and sometimes not, that a trained person can judge a minor complaint unaided. Teachers see this at close quarters, when a student who can recite the mechanism of ibuprofen still takes it on an empty stomach during revision week. Knowing a fact and applying it to oneself turn out to be different skills.

This review collects the published evidence on self-medication among undergraduate health science students. It looks at how common the practice is, which drug groups are involved, what motivates it, what harm has been documented or can reasonably be anticipated, and how education may shape it. The main findings of the included surveys are set out in table 1. The article draws on published surveys, systematic reviews and international guidance and presents no data of its own. Its aim is to describe what is known, to say where the evidence is weak and to suggest where teaching and policy could realistically make a difference. Throughout, the word students refers to people in undergraduate programmes such as medicine, dentistry, pharmacy, nursing and allied health, and groups are separated only where the original sources do so.

2. EXTENT AND PATTERNS OF USE

Reported prevalence varies widely, and much of the variation comes from method rather than behaviour. A pooled analysis of surveys among university students found that a majority had treated themselves in the period asked about, with heterogeneity high enough that any single figure should be treated with caution [10]. Individual studies from Egypt, India, Iran, Pakistan, Saudi Arabia, Serbia and Jordan report that a large share of respondents had used at least one medicine without a prescription over the preceding months [7, 11, 12, 13, 14, 15, 16]. Recall period, the way self-medication was defined and whether herbal products or leftover prescriptions were counted all shift the numbers. Surveys that ask about the previous month give lower figures than those that ask about the previous year, and surveys that count only tablets give lower figures than those that also include ointments, syrups and herbal products. Authors rarely explain these choices in enough detail for readers to correct for them.

Table 1: Selected published surveys of self-medication among university health science students

Setting|focus	Main reported finding	Ref.
Medical students, South India	Analgesics and antipyretics most used; mild illness the usual reason; senior students more likely to self-medicate	[7, 8, 17]
First-year medical students, Bahrain	Self-medication common; students felt knowledgeable, yet answers on safe use were incomplete	[9]
Medical students, Serbia	Frequent use of analgesics; risk factors included year of study and prior experience	[15]
Basic science medical students, Nepal	Positive attitudes towards self-medication; knowledge of risks only moderate	[18]
Pharmacy and medicine students, Saudi Arabia	High prevalence; pharmacy students reported at least as much use as medical students	[14]
Pharmacy students, multiple settings	Easy access to dispensing; knowledge of drugs did not reduce use	[19, 20]
Medical and non-medical students, Jordan	Patterns similar across groups; analgesics and cold remedies dominant	[16]
University students, Karachi and Mansoura	Peer advice and previous experience drove use; antibiotics reported for minor symptoms	[11, 13]

Setting|focus	Main reported finding	Ref.
Southern Iranian university students	Antibiotics taken without prescription for sore throat and diarrhoea	[12]
Systematic reviews, non-prescription antimicrobials	Widespread over-the-counter supply in many regions; resistance concern	[21, 22, 23]
Meta-analysis of university students	Majority self-medicated in recall period; high heterogeneity between studies	[10]

The drugs themselves are fairly predictable. Paracetamol and non-steroidal anti-inflammatory drugs lead nearly every list, followed by antipyretics for fever, antacids, cough and cold preparations, antihistamines and vitamins [7, 8, 14, 17]. Antibiotics appear in a troubling proportion of surveys, usually for sore throat, diarrhoea or urinary symptoms [12, 13, 15]. Oral contraceptives and emergency contraception feature in some female cohorts, and sleep aids or stimulants are reported around examination time [16, 20]. The symptoms behind these choices are mostly minor: headache, fever, menstrual pain, cold, acidity and skin complaints. Complementary products are counted in some studies and ignored in others, which is awkward in countries where a herbal remedy is the first thing a family reaches for. Dosage form matters as well, since topical preparations for skin complaints and drops for red eyes are easy to forget when a respondent is asked what they took.

Comparisons between course years and between disciplines give a mixed picture. Several surveys report higher rates in senior students than in first-year students, which fits the idea that clinical exposure and pharmacology teaching encourage independent decisions [9, 17, 18]. Others find little difference between medical and non-medical students, or modestly higher rates in non-medical groups [16, 20]. Pharmacy students, who handle medicines daily, appear to be among the most frequent self-medicators in the studies that include them [14, 19]. Sex differences are inconsistent. Taken as a whole, the findings are summarised in table 1, which also shows how the main sources of medicines vary between settings. Age, gender and living arrangements are the other variables most often tested, and results change from one campus to the next. The rise across years of study is probably driven less by knowledge itself than by growing independence and easier access to medicines.

Where students get their medicines is as informative as what they take. Community pharmacies are the commonest source in most surveys, often without a prescription even where law requires one [21, 22]. Leftover tablets at home, the stock of a family member and advice from a classmate or senior make up the rest. In some regions a pharmacist's counter operates almost as a primary care point, and student behaviour reflects that wider habit [22, 24]. This matters for interpretation: a student buying amoxicillin over the counter is acting inside a system that allows it, not simply defying what they were taught.

3. REASONS AND INFLUENCES

Students give consistent reasons when asked why they treat themselves. The most frequent is that the illness is mild and does not seem to justify a visit [7, 8, 13]. Saving time comes next, then the cost of a consultation, previous experience with the same symptom and the sense that they already know enough to choose a suitable drug. Some mention distance from home and the absence of a family doctor in a new city. Fewer, but still a notable group, say that they trust their own judgement more than that of an unfamiliar clinician [9, 15]. Convenience, in other words, outweighs risk perception in the decision, a pattern that is well known from studies of the general public in the same regions [3, 24]. Several authors also note that cost is mentioned less often by students who live near a subsidised campus clinic, which suggests that access, not preference alone, shapes the decision [14].

Confidence deserves a closer look. In a few surveys, students who rated their own knowledge as good were more likely to self-medicate, even though their answers on dosing or interactions were not particularly strong [9, 18]. That mismatch is familiar from the wider literature on novice clinicians. A

second-year student who has just finished a block on analgesics may feel entirely equipped to pick a dose, without having yet met the patients in whom the same dose would be harmful. Exposure to drug information raises comfort faster than it builds judgement about when not to act. Teachers who recognise the pattern sometimes describe a curious asymmetry: the same student who would never advise a patient to take an unfamiliar drug without checking a reference may happily do so for a cold of their own. Self-assessment, it seems, is the least rigorous kind of clinical reasoning, because the person making the judgement is also the one with the most to gain from a quick answer.

Social and environmental factors reinforce this. Peer recommendation is a strong driver, particularly in residential colleges where students share medicines and symptoms [14, 17, 25]. Advertising of non-prescription products and the visibility of pharmacies near campuses add to the normalisation of quick fixes. Academic stress, irregular meals and disturbed sleep generate exactly the sort of recurring minor complaints that invite home treatment. Family attitudes also matter: students raised in households where over-the-counter remedies were routine tend to carry the habit forward [24, 25]. These influences operate in the background of ordinary student life and seldom feel like decisions at all [14, 25].

Not all of these influences are negative. Responsible self-care is an accepted part of health policy, and the pharmacist's role in guiding it is recognised internationally [1, 2, 6]. A student who treats an occasional tension headache with a standard dose of paracetamol and a glass of water is doing something broadly reasonable. The difficulty lies in the drift from that behaviour to repeated use without review, to treating symptoms that need assessment, or to using drug classes that should only be started after a diagnosis. Policy statements on self-care recognise this distinction, and so should educators. A fair reading is that self-care is a legitimate goal, and the practice becomes a problem only when it replaces assessment that was actually needed.

4. RISKS AND ANTIBIOTIC USE

The harms of self-medication fall into recognisable groups. Wrong self-diagnosis can delay care for a condition that needs treatment, such as appendicitis presenting with abdominal pain or a serious infection presenting with fever [3, 5]. Incorrect dose or duration leads to toxicity or treatment failure. Interactions are easy to overlook, particularly between over-the-counter anti-inflammatory drugs and anticoagulants, or between several cold products that contain the same active ingredient [4, 5]. Gastrointestinal bleeding, renal injury and hepatotoxicity from paracetamol overdose are the best documented serious outcomes of casual analgesic use [4, 26]. The seriousness of these outcomes is not the same as their frequency. Most episodes pass without incident, which is part of why the habit persists: a student who has taken diclofenac for back pain ten times without trouble has little reason to expect trouble on the eleventh, and the rare bleed or renal event is easy to attribute to something else.

Antibiotics need separate attention. Systematic reviews of non-prescription antimicrobial use report that such use is widespread across both high-income and low-income regions, with the highest burden in places where regulation is weak [21, 22, 23]. European surveys show a clear gradient from low use in northern countries to considerably higher use in the south and east [27]. For students, the usual pattern is a short, partial course taken for a sore throat or loose stool, often stopped when symptoms ease [12, 13, 15, 28]. Shortened or unnecessary courses expose gut and respiratory flora to selection pressure without clinical benefit. Easy access is the usual explanation, since pharmacies in many settings dispense antibacterials on request, and a student asking for one rarely meets resistance at the counter [22, 29].

The link to resistance is the reason antibiotic self-medication carries consequences beyond the individual. Reviews of the resistance problem repeatedly name antibiotic overuse, including use outside prescribed care, as one contributor, alongside agricultural use and poor infection control [30, 31]. A health science student who learns to treat every sore

throat with an antibiotic is likely to carry that expectation into later practice, as a prescriber or dispenser. Tracking how many entries in the evidence base concern antibiotics versus analgesics versus other classes gives a rough picture of where concern concentrates (fig. 1). Whether a student's own behaviour contributes materially to population resistance is difficult to say, but the habits formed during training are likely to matter more than the volume of tablets consumed during those years.

Particular groups carry particular risks. Female students may use analgesics regularly for menstrual pain, and some surveys record emergency contraception and oral contraceptives obtained without consultation, which brings questions about interactions, missed contraindications and follow-up that a pharmacy counter may or may not cover [16, 20]. Students with asthma, peptic ulcer disease or renal impairment are exposed to avoidable hazard if they reach for an anti-inflammatory tablet without checking. Sedative and stimulant use around examinations is mentioned in several surveys, usually in low numbers, but it raises concerns about dependence and about drugs obtained through informal channels [16, 20]. Where a student does seek help after a reaction, the clinician may not hear about the earlier self-treatment unless asked directly, which is a good reason for routine questions about non-prescription use.

Monitoring of harm is a further weakness. Adverse reactions after non-prescription use rarely reach a pharmacovigilance system because the person has no prescriber to report to, and the product may not appear in any clinical record [26, 32]. Students who do experience a reaction may not link it to a medicine they considered harmless. For that reason, the true burden of harm is almost certainly underestimated in the survey literature, which depends on self-report and seldom captures outcomes. Even where a national system exists, reporting from non-prescription settings is thin, and a student who has no prescriber has nobody who would ask about a reaction. Bringing health science students into spontaneous reporting as reporters of their own and others' reactions is one practical way to close part of that gap.

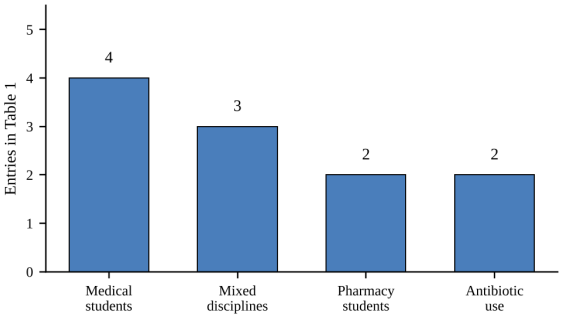


Fig. 1: Number of entries in table 1 by student group or topic

5. KNOWLEDGE AND EDUCATION

Knowledge studies show a patchy picture. Most students can name the commonest analgesics and know that antibiotics are for bacterial infection, but fewer can state maximum daily doses, name interacting drugs or describe when a symptom should prompt medical review [8, 9, 18]. Awareness of labels and expiry dates is good in some groups and poor in others. Attitudes are generally favourable to self-medication for minor illness, and a considerable fraction regard it as acceptable for common complaints even while acknowledging some risk [7, 13]. Attitude, therefore, seems to predict behaviour more strongly than factual knowledge. Where studies compare students at different stages, clinical-year students usually score better on knowledge items but not always on practice, so the gain from teaching seems to reach what students know before it reaches what they do [8, 18].

Teaching can help, though the evidence is thin. Curricula that integrate rational drug use, case discussions on over-the-counter products and practice in counselling appear sensible, and WHO guidance on the core components of rational medicine use supports training at undergraduate level [6]. Some authors recommend early exposure to pharmacovigilance and to patient safety, so that students see harm as a clinical event and not an abstract list in a textbook [26, 32]. Pharmacist-led counselling at university health centres is another option that seems practical, given the role that community pharmacists already play [1, 2]. Whatever the format, the content should treat students as patients as well as future professionals,

because the lecture on analgesic toxicity rarely connects to the packet in a student's own bag.

Comparison with qualified professionals puts the student findings in context. Studies of customers in community pharmacies show that the request for a named product for a self-diagnosed problem is routine, and that pharmacists intervene in only a minority of these exchanges [25, 29]. If qualified staff behave this way in busy settings, it is hardly surprising that students do the same with their own symptoms. The practical lesson is that education aimed at students should also model good practice, through supervised counselling sessions in which the learner plays pharmacist and patient in turn, so that the questions become habitual.

Few studies have actually tested an intervention among health science students. Most conclude with a call for education campaigns, but report no before-and-after comparison, no control group and no follow-up of behaviour. This gap makes it hard to say whether a workshop, a poster or a revised pharmacology module changes anything that counts. Reasonable measures include structured sessions on symptom assessment, a clear institutional policy on dispensing to students, and easy access to an affordable campus clinic, since convenience is the strongest stated reason for avoiding a doctor [7, 13, 14].

Experience from community pharmacy offers a useful comparison. Studies of customers show that people often ask for a named product for a symptom they have already diagnosed, and that pharmacist questioning can redirect a proportion of these requests [25, 29]. A student who has been trained to ask the same questions of themselves, namely how long, how severe, what else is going on and what has already been tried, may be better placed to decide when to stop and seek review. Such reflective habits are easier to teach than to measure.

6. LIMITATIONS AND FUTURE DIRECTIONS

Several limitations affect the evidence summarised here. Most studies are cross-sectional questionnaires from a single institution, with convenience sampling and no validation of the instrument. Self-reported use is open to recall error and to social desirability, especially for antibiotics and contraceptives. Definitions of self-medication differ, some including herbal remedies, supplements or leftover prescriptions and others not [10, 11]. Because of this, direct comparison of prevalence across countries is unreliable, and pooled estimates carry wide uncertainty [10]. Geographic coverage is also uneven, with South Asia, the Middle East and Africa better represented than North America or East Asia. Sample sizes are usually in the hundreds, response rates are often unstated, and few papers adjust for confounders such as course year or sex. Ethical oversight of such surveys is generally light, which is reasonable, yet it also means that methods are seldom reviewed in depth before data are collected.

Future work could usefully take several directions. Standard definitions and a core questionnaire would allow meaningful comparison, and the same cohort followed through a course would show whether training alters behaviour [9, 17]. Studies that capture actual outcomes, such as adverse events, missed diagnoses and resistance carriage, are needed to move beyond descriptions of habit. Qualitative work could explore why trained students trust their own judgement, and trials of simple educational or pharmacy-based interventions would show what works. Until such evidence exists, advice to students has to rest on general principles of rational use [6]. Linking survey responses to pharmacy dispensing records or student health service data, with consent, would give a more objective picture than recall alone.

There is also the matter of what counts as a harmful outcome. A survey that finds half of respondents used a painkiller in the past month has not shown that half were harmed, and the step from prevalence to risk is rarely made explicit. Most authors rely on judgement: use of antibiotics without a diagnosis is considered inappropriate, while an occasional dose of paracetamol is not. That judgement is sensible, yet it is seldom checked against dose, duration or indication,

so the proportion of episodes that were truly inappropriate remains unknown. A shared framework for classifying appropriate and inappropriate self-medication would make future surveys far more informative [1, 4, 6].

A final point concerns the setting. Most research counts what students do, while less examines the environment that makes the behaviour easy. Pharmacy regulation, enforcement of prescription-only status and the availability of affordable primary care shape student choices as much as any lecture [21, 22, 23]. Interventions aimed only at individuals may therefore have limited reach. Any serious response needs to combine education with attention to access and to the rules governing how medicines can be bought on and around campus. The same applies to the evidence itself: much of it comes from institutions where the research was easy to do, not from those where the need is greatest.

7. CONCLUSION

Self-medication is a routine part of life for undergraduate health science students, and training does not remove it. The published surveys describe a consistent picture: mild symptoms, easily available analgesics and antibiotics, convenience as the leading reason and a level of confidence that runs ahead of the actual knowledge shown in questionnaires [7, 9, 18]. Most episodes are probably harmless. The concern lies with antibiotics, repeated analgesic use and delayed assessment of symptoms that deserve review [5, 21, 30]. Reported prevalence depends heavily on definition and recall period, so figures from different studies should not be set side by side without care [10, 11].

Better evidence is needed more than more descriptive surveys. Standard definitions, longitudinal designs and tested interventions would show whether curricula, counselling services and clearer dispensing rules change behaviour in a lasting way [6, 10]. In the meantime, teaching on rational drug use, early exposure to pharmacovigilance and easy access to affordable care on campus appear to be the most defensible steps [1, 2, 26]. Researchers and teachers alike would gain from treating students as a population at risk, not only as future prescribers.

8. ABBREVIATIONS

WHO-World Health Organization, OTC-Over-the-counter, NSAID-Non-steroidal anti-inflammatory drug, ADR-Adverse drug reaction, KAP-Knowledge, attitude and practice

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10. AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

11. CONFLICT OF INTERESTS

Declared none

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