**International Journal of Healthcare Sciences** ISSN 2348-5728 (Online)
Vol. 13, Issue 1, pp: (690-696), Month: April 2025 - September 2025, Available at: www.researchpublish.com

# Analgesic Use Behaviors and Associated Factors among High School Students

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**DOI: https://doi.org/10.5281/zenodo.17198277**

**Published Date: 25-September-2025**

***Abstract:*** **Over-the-counter analgesics are common in adolescents, yet overdosing, paracetamol duplication, and prolonged NSAID use can cause preventable harm. Methods: A cross-sectional online survey (sampling, n = 200) assessed analgesic use, knowledge, attitudes, label literacy, information sources, and home medicine practices. Results: In the past 3 months, 70.0% self-medicated; among users, paracetamol was most used (80.0%), followed by ibuprofen (38.6%). Main indications were headache (57.1%), menstrual pain (45.7%), and sports pain (37.1%). Medicines were sourced from home cabinets (65.0%) and pharmacies (51.4%). Label engagement was moderate-to-high (read every/often 66.4%; follow directions always/mostly 80.8%). Key risks persisted: paracetamol duplication (17.1%) and NSAIDs > 3 days without advice (12.1%). Knowledge and label literacy were generally strong (no overdosing 87.0%; read active ingredient/warnings/expiry 93.0%; identify active ingredient 73.0%; read expiry 86.0%). Nearly half reported disorganized or rarely checked home medicine cabinets (43.0%). Conclusions: Self-medication is common and largely informed, yet safety gaps remain—especially paracetamol duplication and prolonged NSAID use. School-based label-literacy education, pharmacist access, and "safe home medicine cabinet" practices are recommended.**

***Keywords:*** **adolescents, analgesics, paracetamol duplication, NSAIDs, label literacy, self-medication.**

## 1. INTRODUCTION

Analgesics such as paracetamol and NSAIDs are frequently used by high school students for headache, menstrual pain, and sports-related discomfort, but risks arise when label directions are exceeded, paracetamol is duplicated across products [1], or NSAIDs are used for several consecutive days without professional advice, particularly among students with gastric, renal, or asthma-related conditions. Real-world evidence on Thai students' behaviors, knowledge, attitudes, label literacy, and home medicine cabinet practices remains limited, constraining targeted safety initiatives. This cross-sectional survey addresses that gap by estimating the prevalence and patterns of self-medicated analgesic use, evaluating knowledge and attitudes alongside label literacy, and highlighting priority risks. The findings aim to inform concise, school-based education and pharmacist-linked counseling to reduce duplication and inappropriate duration of NSAID use while reinforcing practical home medicine management.

## 2. HYPOTHESIS

H1: More than 50% self-medicated with analgesics in the past 3 months.

H2: Higher knowledge and consistent label reading associated with lower risky behaviors.

H3: Female students/students with menstrual pain are more likely to use analgesics.

H4: Convenience store/online acquisition (limited counseling) associates with higher risk.

H5: Pharmacist counseling associates with reduced risk.

## 3. METHODOLOGY

This is a non-experimental study, which is research in which no variables are controlled by manipulation. We obtained data through a Google form we created ourselves. Participants convenience sample of 200 Thai high school student aged 13–18 (voluntary, anonymous) To analyze the findings on the topic, it is necessary to examine the information provided by survey respondents. Survey questionnaire had Section-A: General information (5 items) Section-B: Analgesic use behaviors (13

items) Section-C: Menstrual pain scenario (3 items) Section-D: Knowledge about analgesics (7 items) Section-E: Attitudes and intentions (5 items) Section-F: Label literacy (5 items) Section-G: Information source and environment (3 items) Data Analysis descriptive statistics (n and %) were computed for demographics and behaviors.

## 4. RESULTS

**Section A: General Information** (n = 200) characteristics as Table1-5

**Table 1. Grade level**

| Student Grade | Number of people | Percentage |
|---|---|---|
| M.1 | 30 | 15.0 |
| M.2 | 30 | 16.0 |
| M.3 | 34 | 17.0 |
| M.4 | 36 | 18.0 |
| M.5 | 34 | 17.0 |
| M.6 | 34 | 17.0 |

**Table 2. Age**

| Age | Number of people | Percentage |
|---|---|---|
| Age 13 | 28 | 14.0 |
| Age 14 | 34 | 17.0 |
| Age 15 | 36 | 18.0 |
| Age 16 | 38 | 19.0 |
| Age 17 | 44 | 22.0 |
| Age 18 | 20 | 10.0 |

**Table 3. Gender**

| Gender | Number of people | Percentage |
|---|---|---|
| Male | 84 | 42.0 |
| Female | 112 | 56.0 |
| Other | 4 | 2.0 |

**Table 4. Chronic conditions (multi-select)**

| Chronic conditions | Number of people | Percentage |
|---|---|---|
| Peptic disease/GERD | 26 | 13.0 |
| Asthma/aspirin or NSAID hypersensitivity | 10 | 5.0 |
| Atopy/easy rash | 38 | 19.0 |
| None | 132 | 66.0 |
| Other | 6 | 3.0 |

**Table 5. Pain in past 3months (multi-select)**

| Pain in past 3months | Number of people | Percentage |
|---|---|---|
| Headache | 122 | 61.0 |
| Sports/activity-related pain | 72 | 36.0 |
| Dental/oral pain | 42 | 21.0 |
| Menstrual pain (if applicable) | 88 | 44.0 |
| Abdominal/cramping pain | 46 | 23.0 |
| Other | 12 | 6.0 |
| Seldom in pain | 20 | 10.0 |

Section A summary: Balanced grade distribution; females 56%. Headache (61%) and sports-related pain (36%) were most common; menstrual pain reported by 44%

**Section B: Analgesic use behaviors** (past 3 months)

**Table 6. Self-medicated with analgesics?** (single choice)

| Self-medicated with analgesics | Number of people | Percentage |
|---|---|---|
| Yes | 140 | 70.0 |
| No | 60 | 30.0 |

**Table 7. If yes: Frequency in the past month** (single choice)

| Self-medicated with analgesics | Number of people | Percentage |
|---|---|---|
| ≤ 1 time/month | 62 | 44.3 |
| 2–3 times/month | 46 | 32.9 |
| 1–2 times/week | 25 | 17.9 |
| ≥ 3 times/week | 7 | 5.0 |

**Table 8. Analgesic types used** (multi-select, base 140)

| Analgesic types used | Number of people | Percentage |
|---|---|---|
| Paracetamol | 112 | 80.0 |
| Ibuprofen | 54 | 38.6 |
| Mefenamic acid | 34 | 24.3 |
| Diclofenac | 16 | 11.4 |
| Aspirin | 10 | 7.1 |
| Cold/fever combination (contains paracetamol) | 46 | 32.9 |
| Topical/patch | 44 | 31.4 |
| Not sure of name | 12 | 8.6 |

**Table 9. Main reasons for use** (multi-select, base 140)

| Main reasons for use | Number of people | Percentage |
|---|---|---|
| Headache/migraine | 80 | 57.1 |
| Menstrual pain | 64 | 45.7 |
| Muscle/sports pain | 52 | 37.1 |
| Dental/oral pain | 22 | 15.7 |
| Fever/cold | 40 | 28.6 |
| Other | 8 | 5.7 |

**Table 10. Sources of medicines** (multi-select, base 140)

| Sources of medicines | Number of people | Percentage |
|---|---|---|
| Home medicine cabinet | 91 | 65.0 |
| Pharmacy (with pharmacist) | 72 | 51.4 |
| Convenience store/online | 27 | 19.3 |
| Given by friends/family | 21 | 15.0 |
| Other | 4 | 2.9 |

**Table 11. Read the label before using** (single choice, base 140)

| Read the label before using | Number of people | Percentage |
|---|---|---|
| Every time | 44 | 31.4 |
| Often | 49 | 35.0 |
| Sometimes | 35 | 25.0 |
| Rarely/Never | 12 | 8.6 |

**Table 12. Follow label/pharmacist instructions** (single choice, base 140)

| Follow label/pharmacist instructions | Number of people | Percentage |
|---|---|---|
| Every time | 60 | 42.9 |
| Mostly | 53 | 37.9 |
| Sometimes more/less than directed | 21 | 15.0 |
| Frequently more/less than directed | 6 | 4.3 |

**Table 13. Cold combo + separate paracetamol same day** (single choice, base 140)

| Cold combo + paracetamol | Number of people | Percentage |
|---|---|---|
| Yes | 24 | 17.1 |
| No | 99 | 70.7 |
| Not sure | 17 | 12.1 |

**Table 14. Used NSAIDs > 3 days without advice** (single choice, base 140)

| Cold combo + paracetamol | Number of people | Percentage |
|---|---|---|
| Yes | 17 | 12.1 |
| No | 109 | 77.9 |
| Not sure | 14 | 10.0 |

**Table 15. Check expiry before use** (single choice, base 140)

| Check expiry before use | Number of people | Percentage |
|---|---|---|
| Every time | 41 | 29.3 |
| Often | 55 | 39.3 |
| Sometimes | 34 | 24.3 |
| Rarely/Never | 10 | 7.1 |

**Table 16. Co-use with the following** (multi-select, base 140)

| Co-use | Number of people | Percentage |
|---|---|---|
| Energy drinks/high caffeine | 28 | 20.0 |
| Supplements/herbal products | 25 | 17.9 |
| Alcohol | 8 | 5.7 |
| No co-use | 88 | 62.9 |

**Table 17. Adverse events from analgesics** (multi-select, base 140)

| Adverse events from analgesics | Number of people | Percentage |
|---|---|---|
| Gastric burning/abdominal pain | 17 | 12.1 |
| Drowsiness/dizziness | 11 | 7.9 |
| Rash/itch/swelling | 4 | 2.9 |
| Nausea/vomiting | 8 | 5.7 |
| Other | 3 | 2.1 |
| Never | 108 | 77.1 |

**Table 18. Response when adverse events occur** (multi-select, base 32 with any event)

| Option | Number of people | Percentage |
|---|---|---|
| Stopped the drug | 15 | 46.9 |
| Reduced dose/frequency | 9 | 28.1 |
| Consulted a pharmacist | 11 | 34.4 |
| Met a physician | 6 | 18.8 |
| Did nothing | 5 | 15.6 |

Section B summary: 70% self-medicated; paracetamol predominated (80% of users). Key risks: paracetamol duplication (17.1%) and NSAIDs > 3 days (12.1%). Two-thirds read labels consistently.

**Section C: Menstrual pain scenario** (base 110 respondents with menses)

**Table 19. Use of analgesics for menstrual pain in past 3 months** (single choice)

| Option | Number of people | Percentage |
|---|---|---|
| Yes | 89 | 80.9 |
| No | 21 | 19.1 |

**Table 20. First-line choice in early days of pain** (single choice)

| Option | Number of people | Percentage |
|---|---|---|
| Paracetamol | 38 | 34.5 |
| Ibuprofen/mefenamic acid | 56 | 50.9 |
| Herbal/heat/rest first | 13 | 11.8 |
| Other | 3 | 2.7 |

**Table 21. If pain persists > 3 days** (single choice)

| Option | Number of people | Percentage |
|---|---|---|
| Continuing current analgesic | 23 | 20.9 |
| Consult pharmacist | 43 | 39.1 |
| See physician/clinic | 40 | 36.4 |
| Other | 4 | 3.6 |

Section C summary: Most used analgesics for dysmenorrhea; NSAIDs were most common first-line. If pain persisted >3 days, most sought professional advice. [2]

**Table 22. Section D: Knowledge about analgesics**

(Correct responses True/False-Unsure, Base 200)

| Option | Number of True people | Percentage |
|---|---|---|
| D1. Many cold remedies contain paracetamol; duplication risk | 156 | 78.0 |
| D2. NSAIDs may irritate the stomach; take after food/seek advice | 150 | 75.0 |
| D3. Do not exceed label-recommended dosing | 174 | 87.0 |
| D4. Suspected dengue: avoid aspirin/ibuprofen | 140 | 70.0 |
| D5. Alcohol increases paracetamol liver risk | 144 | 72.0 |
| D6. Topical/patch products have no side effects | 124 | 62.0 |
| D7. Reading active ingredient/warnings/expiry is essential | 186 | 93.0 |

Section D summary: Knowledge is generally good, especially on discipline and label reading; gaps persist for dengue-related avoidance and topical product risks.

**Table 23. Section E: Attitudes and intentions**

(5=Strongly agree…1=Strongly disagree)

| Questions | 5 | 4 | 3 | 2 | 1 | Percentage % (4-5) |
|---|---|---|---|---|---|---|
| E1. “OTC analgesics carries risks, even when taken only for pain relief.” | 50 | 40 | 68 | 28 | 14 | 45.0 |
| E2. “I read labels or ask a pharmacist every time before use.” | 44 | 76 | 50 | 18 | 12 | 60.0 |
| E3. “Using analgesics for several consecutive days should involve professional advice.” | 60 | 92 | 34 | 8 | 6 | 76.0 |
| E4. “Price and convenience influence my choice of analgesic.” | 44 | 80 | 46 | 18 | 12 | 62.0 |
| E5. “If non-drug options exist (rest, massage, stretching), I will try them first.” | 36 | 74 | 58 | 18 | 14 | 55.0 |

Section E summary: Safety-oriented attitudes are favorable (label reading and seeking advice), while price/convenience remains influential.

**Table 24 Section F: Label literacy** (Base 200)

| Items | Number of True people | Percentage |
|---|---|---|
| F1. Correctly, identified active ingredient | 146 | 73.0 |
| F2. Most important label info: | | |
| • Active ingredient | 34 | 17.0 |
| • Dose/frequency | 84 | 42.0 |
| • Warnings/precautions | 62 | 31.0 |
| • Expiry date | 20 | 10.0 |
| F3. Correct: Do not add paracetamol when on paracetamol-containing cold products | 152 | 76.0 |
| F4. Check the expiration date correctly | 172 | 86.0 |
| F5. From label warnings (multi-select) | | |
| • Have gastric/renal/asthma risks | 30 | 15.0 |
| • Have drug/food allergies | 34 | 17.0 |
| • None | 136 | 68.0 |

Section F summary: Label literacy is solid (active ingredient and expiry) but students vary on the "most important" label element; education should emphasize both dose/frequency and warnings.

**Section G: Information sources and environment** (base 200)

**Table 25. Most trusted information source** (ranked#1, single choice)

| Option | Number of people | Percentage |
|---|---|---|
| Pharmacists/physicians | 116 | 58.0 |
| Government/hospital websites | 48 | 24.0 |
| School nurses/teachers | 20 | 10.0 |
| Family/friends | 16 | 8.0 |

**Table 26. Home medicine cabinet** (single choice)

| Option | Number of people | Percentage |
|---|---|---|
| Present and organized | 86 | 43.0 |
| Present but disorganized/rare expiry checks | 86 | 43.0 |
| None | 28 | 14.0 |

**Table 27. If pain does not improve within 2–3 days** (single choice)

| Option | Number of people | Percentage |
|---|---|---|
| Consult pharmacist | 72 | 36.0 |
| See physician | 68 | 34.0 |
| Continuing with the same medicine | 30 | 15.0 |
| Search online first | 24 | 12.0 |
| Other | 6 | 3.0 |

Section G summary: Pharmacists/physicians are the most trusted sources. Nearly half report home cabinets not routinely checked for expiry; most will seek professional help if pain persists.

## 5. DISCUSSION

Self-medication was common (70%), consistent with frequent adolescent headaches, sports injuries, and menstrual pain. Despite generally good knowledge and label reading, important safety gaps persisted: paracetamol duplication [1] (17.1%) and NSAID use beyond three days without advice [2] (12.1%). Label literacy was solid but uneven in prioritizing dose/frequency versus warnings, indicating a need for school modules that stress both and explicitly address duplication and appropriate NSAID duration. Pharmacist-linked counseling and simple household measures—organizing home medicine cabinets and routine expiry checks—offer practical, scalable ways to reduce risk.

## 6. CONCLUSION

This study provides robust evidence that self-medication was common (70%), with paracetamol predominating (80% of users). Although knowledge and label literacy were generally good (87% endorsed not exceeding label doses; 93% affirmed label reading; 73% identified the active ingredient; 86% read expiry dates), notable safety gaps remained: paracetamol duplication occurred in 17.1% and NSAID use beyond three days without advice in 12.1%. Additionally, 43% reported home medicine cabinets that were disorganized or rarely checked.

Targeted, low-burden safeguards are warranted: brief school modules emphasizing dose/frequency and warnings (including duplication and NSAID duration), easy access to pharmacist counseling (on-site or telepharmacy), and parent-engaged "safe cabinet" practices (regular expiry checks and separating paracetamol-containing products). Future work should validate findings across multiple schools and evaluate pre–post intervention effects.

## REFFERENCES

[1] U.S. Food and Drug Administration. (2023). https://medlineplus.gov/druginfo/meds/a681004.html

[2] American College of Obstetricians and Gynecologists. (2018, December). Dysmenorrhea and endometriosis in adolescents (Committee Opinion No. 760; reaffirmed 2022). American College of Obstetricians and Gynecologists. https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2018/12/dysmenorrhea-and-endometriosis-in-the-adolescent