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Review article

## A Systematic Review of Self-Medication Practices Among Adolescents



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 A B S T R A C T

The purpose was to systematically review the global trends and factors influencing self-medication (SM) among adolescents. Databases (Medline/Pubmed, Ingenta, Cochrane Library, EMBASE, CINAHL, Proquest, Scopus, and Google Scholar) were searched for peer-reviewed research published between January 2000 and December 2013 on SM among adolescents aged 13–18 years. Articles were scrutinized for country of origin, sample size, recall period, prevalence rates and associations, influencing factors, medicines used, self-medicated health complaints, sources of drug information, recommendation and procurement, knowledge about medicines, and adverse drug reactions. One hundred and sixty-three publications met the inclusion criteria. SM prevalence ranged from 2% to 92% in different countries. The most frequently self-medicated over-the-counter and prescription-only medicines were analgesics and antibiotics, respectively. Headache, allergies, and fever were the most common self-medicated health complaints reported. Misuse of both over-the-counter and prescription-only medicines reflected a risky trend. Female gender, older age, maternal education, and familial practices were associated with SM among adolescents. The primary sources of drug information, recommendation, and procurement included pharmacists, parents, and friends. High-risk practices such as diversion of prescription medicines and utilization of previous prescriptions were also reported. Most studies revealed gaps in drug knowledge, although adolescents self-rated it as satisfactory. However, few adverse drug reactions were reported, probably because of lack of awareness about the potential harmful effects of medicines. Recommendations for “responsible SM” have been made to minimize the adverse effects of SM. Understanding the links between various factors promoting SM can be helpful in deriving strategies aimed at reducing drug-related health risks among adolescents. Moreover, these will aid in creating awareness among adolescents about the potential risks of using drugs without proper information and consultation. Studies need to be designed to assess the changing trend and identify new correlates of self-medication practices among adolescents, which pose fresh challenges to monitor the menace.

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**IMPLICATIONS AND CONTRIBUTION**

This review identifies factors that influence self-medication among adolescents. These factors need to be considered while planning strategies to create awareness regarding “Responsible self-medication,” which will result in safer use of medicines. Association between SM practices during adolescence and adulthood needs to be explored.

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“Responsible self-medication (SM)” involves treatment of self-recognized disorders or symptoms, through the use of medicines that are approved, available without prescriptions (over-the-counter [OTC] drugs), and are considered relatively safe and effective when used as directed [1,2]. SM is one of the common health risk behaviors encountered among adolescents [3]. Moreover, habits picked up during this stage are usually

carried forward during adulthood [4] and may lead to misuse of the drugs [5]. This has often raised serious concerns by the medical fraternity and the society.

Several factors have been reported to influence the SM behavior among the adolescents [6,7]. A positive attitude toward self-care and overconfidence in medication knowledge often act as driving force for SM [2,8] and misuse of drugs [9]. Adolescents use medicines without a prescription, use old prescriptions, share medicines with friends/relatives, and use leftover medicines from previous prescriptions/stocks at home [5,10]. Both OTC and prescription-only medicines (POMs) could easily be accessed without having necessary information on indications and contraindications, subjecting them to undue risk [8,11,12]. Although adolescents do exhibit a sense of responsibility, the potential risks associated with SM can be misuse, overuse, or abuse of drugs [9].

Several studies and reviews on SM practices among adolescents have been published in different regions of the world in the past decade, each assessing different classes of drugs and associated factors. A minireview described the SM frequency in children and adolescents in five countries [13], and another systematic review focused on POM use among U.S. adolescents [14]. Two other reviews dealt with nutritional supplements among young athletes [15] and adolescents [16]. Others focused on the misuse of anabolic steroids among adolescents [17–23]. However, all these reviews did not provide a global perspective on the correlates of SM among adolescents.

The objective of this review was to provide an overview of the extant literature on SM among adolescents. It gives a comprehensive account of adolescent behavior toward SM with respect to prevalence rates and associations; factors promoting/facilitating SM; OTC drugs and POMs used; self-medicated health complaints; sources of drug information; recommendation and procurement; adult guidance; adverse events encountered; general knowledge about drug, their benefits, and risks; and recommendations for “responsible SM.”

## Methods

### Search strategy

Databases, namely Medline/Pubmed, Ingenta, Cochrane Library, EMBASE, CINAHL, Proquest, Scopus, and Google Scholar, were searched for peer-reviewed research published between January 2000 and December 2013. Primary search terms, “Adolescent,” “Self medication,” “Prevalence,” “Drug Utilization,” “Non-prescription Drugs,” and “Prescription Drugs,” were used in various combinations. In Medline (MESH database), the search term “Self medication” was used in MAJR (main subject heading) combined (AND) with “Adolescent and Prevalence”. All search terms were “exploded.” In addition, manual searches were done for the relevant articles in the following journals: *Journal of Adolescent Health*, *International Journal of Adolescent Medicine and Health*, *Journal of Adolescence*, *JAMA Pediatrics*, and *Journal of Adolescent Research*. Reference lists and potentially relevant citations of articles identified through the primary search were also examined.

### Article selection

All full-length articles, reviews, editorials, original articles, and short communications published in English language and

English abstracts of articles published in other languages dealing with SM among adolescents aged 13–18 years were reviewed. SM was defined as “obtaining and consuming drugs without the advice of a physician to treat self-recognized illnesses or symptoms” [1,2]. Studies in population over a wider age range were considered, only if the analyses included the pertinent data of the desired age group, that is, 13–18 years. Studies dealing with specific drug groups and those which clearly specified the recommender as anyone other than a physician were also included. All articles dealing exclusively with drug usage among adults or children (<13 years) were excluded. Studies with combined data on adolescents, children and/or young adults, or those not focused on SM were also excluded. Moreover, opinion pieces and critiques of prior studies were not considered in the review.

### Data abstraction

The lead reviewer (S.I.S.) along with another reviewer (A.K.A.) screened the articles based on the inclusion–exclusion criteria. The following details were extracted from each study using an abstraction form: year of publication, country of origin, population sampled, recall period, and data pertaining to the study objectives. Data were extracted by all three authors, and differences, if any, were resolved by consensus between them.

### Assessment of methodological quality

A critical appraisal checklist, based on guidelines for reporting observational studies [24–26] and previous studies [27–29], was used to assess the methodological quality of reviewed articles independently by two reviewers (S.I.S. and A.K.A.). The individual appraisal results were discussed, and the final appraisal confirmed. Disagreements were resolved through discussion. The evaluation included the following four features: the sample (recruitment, representativeness, descriptive data, response rates, and sample size); definition of SM; validity of data collection (methods, reproducibility); and analysis (statistics, confounding factors). The quality criteria were clearly defined a priori. Studies with a score of 7–10 points were considered to be of high quality, 4–6 of medium quality, and 1–3 of poor quality.

## Results

### Literature search results

A two-stage process was used in the selection of eligible studies. The database search yielded 2,637 publications for review. Title examination of 2,313 articles revealed that they did not deal with adolescents/SM/drug utilization (including 400 duplicates) and were excluded. The remaining 324 articles underwent abstract review. Independent review of abstracts led to further elimination of 98 articles (77 out-of-target age range and 21 non-English abstracts) and provided 226 articles for detailed review.

A secondary search was performed to elaborate the primary concept. Hand search of reference lists, citations of important articles, and Web sites of the previously specified journals resulted in an additional 130 articles, of which 77 were exclusively related to SM among adolescents.

Full texts of 303 articles were retrieved and reviewed. This resulted in 163 articles which fulfilled the inclusion criteria. The

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