

Study finds one in 12 children taking multiple medications at risk

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Dima Qato. Credit: UIC Media Library

According to new research from the University of Illinois at Chicago, about one in five children regularly use prescription medications, and nearly one in 12 of those children are at risk for experiencing a harmful

drug-drug interaction. The findings from the study, which is published in the journal *Pediatrics*, indicate that adolescent girls are at highest risk of potential adverse events due to drug-drug interactions, or DDIs.

Although [adverse drug events](#) are a leading cause of injuries and death among both [children](#) and adolescents in the U.S., information on how younger populations use the prescription medications that potentially could lead to these adverse events is lacking.

To fill this gap, the researchers retrospectively analyzed medication use patterns of more than 23,000 children and adolescents living in the U.S. based on data collected as part of the National Health and Nutrition Examination Survey from 2003 to 2014. Included in the study was a nationally representative sample of children and adolescents ages 0 to 19 who responded or whose parents responded to a questionnaire on prescription medications.

The researchers found that nearly 20 percent of children had used at least one [prescription medication](#). Nearly 14 percent used chronic medications and 7 percent used acute medications. Chronic medication use was defined as taking at least one prescription medication for more than 30 days and acute medication as taking at least one for medication for less than 30 days.

Analysis also showed that medication use increased with age, from 14 percent in children younger than 5 years to 22 percent in adolescents 13 to 19 years.

The most common medications were respiratory agents and psychotherapeutic agents. Respiratory agents, used primarily in the management of asthma, included bronchodilators and leukotriene modifiers. Psychotherapeutic agents included CNS stimulants and antidepressants, which are associated with rare but serious adverse

effects like thoughts of suicide, serotonin syndrome and even sudden death.

Lead author Dima M. Qato, assistant professor of pharmacy systems, outcomes and policy at the UIC College of Pharmacy, says the findings not only provide valuable insight on how many young people in the U.S. regularly use prescription [medication](#), but more importantly show that polypharmacy—the use of multiple medications simultaneously—is also common and comes with a potential risk.

According to the study, approximately 7.5 percent of children used multiple medications simultaneously, and among them, one in 12 was at risk for a major drug-drug interaction. Among those using multiple medications, adolescent girls were at highest risk, with nearly one in five using interacting drug regimens.

The vast majority of these potential interactions involved antidepressants with the most common potential adverse interaction effect being QT prolongation—an abnormal heart rhythm that can cause sudden death in otherwise healthy kids. The researchers report that this risk is "especially noteworthy" given that condition is often asymptomatic and [sudden death](#) is an under-reported problem in children.

"The gender difference was largely due to the higher concurrent use of antidepressants with acute medications like NSAIDs, anti-emetics and macrolide antibiotics in [adolescent](#) girls," Qato said.

Other findings from the study showed that prescription medications associated with an increased risk of suicide are among the most commonly used, often in combination. For example, more than half of [adolescent girls](#) taking antidepressants concurrently use at least two other psychotropic medications or oral contraceptives.

"Although there are health benefits associated with these medications, the patterns with which adolescents are using them are worrisome because suicide is a leading cause of death in older children and adolescents and there is some evidence that the combined use of these drugs may increase the onset and severity of suicidal thoughts and behavior," Qato said.

In contrast to QT prolongation and serotonin syndrome, suicidality is not captured as a potential DDI in existing drug interaction software.

"Therefore, health care professionals, including psychiatrists, may not be aware of the suicidal risks associated with the concurrent use of [prescriptions](#) in the treatment of depressive symptoms in younger patients," the researchers write.

Although this study did not evaluate the incidence of adverse drug events specifically in association with the concurrent use of prescription medications, Qato and her colleagues say that they hope the findings will be used to inform preventive efforts and promote awareness of the potential for drug-drug interactions and increased risks associated with the concurrent use of prescription medications, particularly suicidality and QT prolongation.

"Such efforts may include the incorporation of a list of commonly used medications and interacting combinations associated with increases in QT prolongation and suicidal risks in treatment guidelines and screening tools for depression," the authors write.

More information: *Pediatrics* (2018). [DOI: 10.1542/peds.2018-1042](https://doi.org/10.1542/peds.2018-1042)

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