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# Safety of Herbal Medicines in Children

*Sevinç Polat and Ayşe Gürol*

## Abstract

Herbal medicine is used by individuals of all ages, including children. Herbal medicine includes herbs, herbal materials and preparations, and finished herbal products. Herbal medicine or herbal products' use for all ages have increased in recent years. Based on the data of the World Health Organization, almost 80% of the population in developing countries trust herbal medicines to meet their health needs. Herbal medicines use unconsciously as though these products are harmless. The use of herbal products in children is a concern because little information is available concerning the benefits and risks of these products in the pediatric population. This creates a serious problem in the treatment of children, and reveals a serious and under-recognized hazard in clinical care. The safety of most herbal medicinal products is absent since lack of suitable quality controls and not available of appropriate patient information. Owing to the possibility of serious health complications arising from the use of herbal products, it is mandatory to understand their use in the general population in order for appropriate measures to be put into place.

**Keywords:** children, herbal medicine, nursing, use of herbs, toxicity

## 1. Introduction

Herbal medicine is the use of only plants for medicinal and therapeutic purpose to treat the diseases and to improve human health [1–4]. Herbal medicine is the most commonly used complementary and alternative medicine (CAM) [5]. World Health Organization (WHO) has defined herbal medicines as last labeled medicinal product that contain an active ingredient, aerial, or underground parts of the plant or other plant material or combinations [4, 6]. Herbal medicine is classified into three groups: 1) herbal drugs have proven efficacies and known active compounds and doses, 2) have expected efficacies, active compound needs to be standardized, and 3) uncertain efficacies [4, 6].

Herbal medicine includes herbs, herbal materials, and last herbal products. In some countries, herbal medicine may contain natural organic or inorganic active ingredients [7]. The number of medicinal plants as medicine is around 20.000 and they are also used for adding taste, odor and color to food since the ancient times [8].

In the 21st century, herbal medicine has been considered as a promising future medicine for people health [4]. During long time before the modern medicine, herbs had been the mainstream remedies for nearly all illness [1, 4]. People had commonly diagnosed illnesses themselves, prepared and prescribed their own herbal medicines for thousand years ago [1]. Herbal remedies, nowadays, it still

plays an important role in the health care and most of people rely on herbal medicine for their primary health care [9, 10].

Herbal plants for medicine are easily obtainable without prescription or prescribed by herbal practitioners. Due to drug resistance and difficulties in finding accessible and reliable drugs, herbal medicines have become an alternative option in our healthcare system [11].

Herbal medicines have been used either alone or in combination with conventional medicines [11]. But even though herbal products are frequently used and regarded as 'natural', they can also cause adverse drug reactions [9, 12, 13] as well as adverse interactions with other medicines [9, 14, 15].

Herbal remedies are generally considered as safe, though their efficacies are unclear and their adverse effects may vary from human to human [2]. Despite of increasing popularity of herbal medicine, their safety and effectiveness have not been scientifically proven [1]. According to their wide use, many herbal products used frequently have not undergone complex scientific analyses via clinical experiments [9]. Though its reported that some of these plants have medicinal properties in the literature it has also been showed that other plants could be not safe for consumption as being toxic and adverse effects in the human body [4, 16]. Therefore, the aim of this review is to understand the current status of the herbal medicine used on the children and adolescents.

## **2. Prevalence of herbal medicinal product use**

The use of herbal remedies has increased in recent years. It is predicted that this rate will be greater for the COVID-19 pandemic process. WHO has been reported nearly ~80% of the world's population uses and trust herbal products for treatment [17–20].

About 2.9 million American children and teenagers have used herbs or their supplements [21]. In China, the use of herbal medicine is about changing from 30–50% of the total drug consumption. It is estimated that in other developed countries, more than 50% of the population use herbal products at least once in their life. The herbal medicines account for 60% of treatment at home in developing countries [4, 22]. In the children with a chronic illness or among inpatients and outpatients are higher use of the herbal medicine [9, 23].

The using herbal drugs among children are 85.5% in Germany [23]. Children with neuropsychiatric diseases use herbal medicine about 35.4% [24]. The elementary school-age children in South Korea have epileptic problems ~17.2% and they use herbal medicine at high range varying from 65.2% to 67.8% [25]. In Turkey, the prevalence of pediatric use of herbal drugs was 58.6% [26]. Bülbül et al. [27] reported that 27% of parents, who used herbal products for their children within 1 year, used them without a doctor's recommendation [27].

## **3. Areas of herbal medicinal product use**

The use of at least one herbal or food product has been commonplace during episodes of acute illness among African American communities [28]. Families with children who have chronic medical conditions, such as autism, cystic fibrosis, rheumatoid arthritis, respiratory tract infections or asthma use to herbal remedies as part of their treatment [1, 10, 29–31]. The majority of herbal remedies are used to treat coughs, colds, and intestinal disorders [9].

The herbal medicine use in children with respiratory illnesses was 59.3% [32]. Parents of children with asthma reported using a range of herbal products (12.8%) for self-care [33]. The most common used herbal medicine for pediatric asthmatic patients were linden (21.6%) and ginger (21.2%) [34]. Herbal medicine has traditionally been used in the treatment of symptoms for nocturnal enuresis or urinary incontinence [35–37].

The ginger, chamomile, mint, cardamom, garlic and onion were used to prevent and treat nausea caused by chemotherapy [38]. It has been reported some herbal products are effective in the management of ear pain in Otitis Media [2]. Children with Attention Deficit Hyperactivity Disorder and Anxiety of Depression take herbal products a part of their treatments. The use of CAM in children with medical comorbidities, excessive sleep problems or insomnia is 1.8 times higher than children without such difficulties [39]. It is reported that herbs significantly decreasing body temperature, cough and breathing difficulties, and improving absorption of pulmonary infiltration and quality of life on the severe acute respiratory syndrome (SARS) [40]. The herbal formula (Ma Xin Shi Gan Tang) was claimed to antiviral effect on which inhibits the entry of influenza virus and have potential in managing seasonal pandemics of influenza infection [41].

#### **4. Toxicity of herbs**

Herbal products were used mainly because of hearsay recommendation, dissatisfaction with conventional medicine, and fear of adverse-effects of drugs [30]. It is important to understand that mothers consider herbs to be ‘natural and safe’ and are therefore more willing to try herbal remedies such as herbs, olive oil, and food for their babies’ health. This is no different to any other country, where the local ‘health food shop’ and vitamin bars in pharmacies are well frequented by concerned parents. For some participants, decisions regarding use of traditional practices are usually made by an extended family member or through advice from virtual support groups and social media [42].

The herbal medicines have been obtainable without prescription and professional advices. This practice could lead to harm in children. Because of the variability in herbal product ingredients, the actual dose of active ingredients being consumed is often variable and unknown. When compared with adults, since children have smaller sizes and their immature systems they may be particularly susceptible to the effects of such dosage variations [29]. For this reason, before the administration of any therapeutic agents into children’s body, the mothers must be taken into attention to consider the anatomy and physiology of them. The development level of organs such as brain, liver, and kidney affect rate of the absorption, distribution, metabolism and excretion of drugs. The inappropriate doses could lead to the accumulation of drugs in the body and finally cause the toxic effects. The unstandardized preparation of herbal medicines by manufacturer and contaminants (metals, chemical drugs, etc.) create a risk for children’s health [29, 43]. Herbal products are widespread usages in children; professionals should be aware of this and be alert for possible side-effects/interactions [30].

Herbal medicines have some drawbacks such as contamination with chemicals. One of the most contaminants is pesticide on the herbal products [44]. The wide spread use of pesticides in agriculture has caused severe environmental pollution and possible health hazards including severe acute and chronic poisonings. WHO estimates that the incidence of pesticide poisonings in developing countries has doubled during the past decade [45, 46].

Herbal products can also produce adverse side effects that range from mild one to fatal ones. For example; herbs believed to have an effect on blood-clotting abilities may cause serious side effects for patients with certain blood-related conditions such as hemophilia. Some herbs may increase the effects of anticoagulant medications, and then it may be creating the risk of bleeding [1].

## **5. Advice to parents**

Health care practitioners might be considered some practical points, when parents come to counsel about herbal medicine. Parents should realize that all herbal medicine is not safe [30]. Parents have to be informed about the potential risk or adverse effects of the long-term use of herbal products [47]. When parents are informed about herbal products it maybe prevents the negative interactions [30, 48]. Parents have to be understood that natural is not equal to safe [29].

Unless parents must have the essential knowledge on herbal products, they do not give the herbal remedies to their children [18, 43]. It is important for clinicians to ask the question to find out the beliefs and alternative therapies of the parents, and it is necessity to understand whether they give the herbal remedies in their children [29]. Lack of information about taken herbal remedies by child can prolong a hospital stay or hamper the clinician's approach to diagnosis and management [29].

## **6. Herbal medicine for the treatment COVID-19**

On these days, herbal medicine plays a major role in the prevention and treatment of many diseases also as the novel coronavirus. Chinese medicine is the pioneer of herbal medicine among all of the countries [49]. There was wide usage of traditional Chinese medicine through the last SARS-COV outbreak. The five most famous applied herbs were Astragali Radix (Huangqi), Saposhnikoviae Radix (Fangfeng), Glycyrrhizae Radix Et Rhizoma (Gancio), Atractylodis Macrocephalae Rhizoma (Baizhu), and Lonicerae Japonicae Flo [50].

Du et al. [51] have summarized the theoretical foundation, potential effect of Chinese herbs on COVID-19 patients, and Yang et al. compared the evidence of current applications of traditional Chinese's herbs in the treatment of COVID-19 patients [52]. Today's, many guidelines related to herbal medicine have been issued for the prevention and treatment of COVID-19 [50, 53]. The herbs were commonly recommended in some symptoms, like fatigue, fever, chills, heavy limbs, and gastrointestinal symptoms in these guidelines [54]. Recent clinical evidence have also showed the therapeutic effectiveness of traditional medicine in treating different stages of COVID-19 [55–59]. Wang et al. [60] investigated effect of traditional Chinese medicine on hospitalized patients with COVID-19. They suggested that patients should receive Kaletra early and should be treated by a combination of Western and Chinese medicines [60]. Li et al. [61] were reported that Lianhua Qingwen had antiviral and anti-inflammatory activity against SARS-CoV-2 in their experimental study. Traditional Chinese Medicine has suggested to prescribe the herbs that are likely to be effective in the diagnosis and treatment plan of COVID-19 [62]. Notably, the usage frequency of Armeniacae Semen was highest among the herbal formulae recommended for the treatment of pediatric COVID-19 [63]. The herbal products' diversity for the recommended treatment of pediatric COVID-19 is lower compared to the adults. This might be due to the difference in the spectrum of diseases between the children and the adults [64].

## 7. Nurses's role

Overall, the type of herbal products changes all of the worlds. Besides it can be changes in the different societies at one country. Their usage is high prevalence among most traditional society [42]. In Taiwan, about 60% of participants reported that use folk remedies during their child's hospitalization, and the 72% of them would not inform healthcare providers about usage of folk remedies to their children [65]. This illustrates that it is important health practitioners, including nurses, are aware of the use of folk remedies within the community, and investigate about the use of folk remedies or traditional healing practices in a non-judgemental manner [42].

The growing trend of herbal products' uses is a major challenge to health system, children and families. To ensure the quality and safety of nursing interventions to child and mothers, it is important to learn the mothers' knowledge on beliefs and barriers to health care in their living. In addition, nurses need to be open to listening to patients and admitting their practice of traditional remedies while evaluating risks to create a nursing care plan [66]. The nurses have regular contact with parents within the healthcare centers or family health services [67]. Nurses are required to be have sufficient understanding and knowledge about CAM therapies [68]. Therefore, nurses can be credible sources for parents who need the accurate and trust information on herbal medicinal products. Nurses have to ask to parents what methods they used to understand if the parents have any qualms or difficulty obtaining prescription medications for their child [69].

## 8. Conclusion

The usage of herbal medicines increases day by day. People usually choose the herbal products instead of medical drugs [46]. The use of medical plant species in the treatment of children diseases is a part of traditional knowledge that is handed down by hearsay advices [20].

Herbal medicine can be unconsciously used as though these products are harmless [70, 71]. The use of herbal products in children is a concern, because a few information is available on their benefits and risks at these population [72, 73]. This creates a serious problem in the treatment of children, and it can be occurred a serious hazard in clinical care [74]. Since herbal products are available not only in pharmacies, but also in food stores and supermarkets there is a serious risk to users and remains a major concern about the herbal drug safety issue [18].

As the global use of herbal products continues to increase and many more new products are introduced into the market the risk will be greater for public health day by day [75]. The risk increases because of compromised by lack of suitable quality controls, inadequate labeling, and the absence of appropriate patient information [76].

Most herbal medicines have not been subjected to rigorous clinical trials As a result, it still continues the lack of evidence-based information about the efficacy and safety of herbal products in children [1, 77]. Despite of the high prevalence of herbal remedies' uses, there is a communication problem between CAM users and healthcare professionals. Healthcare professions both have to ask about herbal remedies' uses and inform to their patients or their parents about herbal medicine. Also, parents have to inform to their physicians on herbal remedies' uses to their children during conventional treatment [78]. Health professionals must recommend to parents the correct use of herbal medicine in children, assist in herbal

therapeutic decisions, and monitor for adverse effects and interactions [1, 77]. Finally, herbal products or folk remedies may be inherently unsafe. Owing to the possibility of serious health complications arising from the use of herbal products, it is mandatory to understand their use in the general population in order for appropriate measures to be put into place [32].

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