

Libyan mothers' awareness of natural products among infants

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Abstract: In Libya, mothers commonly use natural products for their infants. The purpose of this survey was to evaluate the level of awareness of mothers using natural products for their infants, a validated questionnaire-based survey was distributed to mothers in several hospitals, and the selected random group included 152 mothers of infants aged from day one birth to one year old, an analysis of the data revealed that 68.0% of mothers were using natural products and the most predominant age was between 20-30 years, 63.0% were living in Tripoli and 52.0% were undergraduate level of education. Further statistical analysis revealed a significant difference in measuring the degree of awareness of all the natural products combined together ($p=0.001$) and a similar degree of considerable difference in the degree of awareness of each natural product alone ($p=0.001$). A correlation coefficient test by Spearman was performed to evaluate if there is any association between participants' demographic data and the question which measures the level of mothers' awareness. The results showed that mothers have no awareness of how to use these natural products and no correlation between the participants' demographic data and the way the mothers use these natural products, except between the fennel and the education level ($p=0.033$, $p<0.05$, respectively). In conclusion, mothers have no awareness of how to use natural products, and appropriate attention by healthcare providers should be given to nursing mothers for herbal use.

Introduction

The use of natural products as medicines has been declared throughout history in traditional treatments, remedies, potions and oils with many of these bioactive natural products still being unidentified. The dominant source of knowledge of natural product use from medicinal plants is a result of man experimenting by trial and error for hundreds of centuries through palatability trials or untimely deaths, searching for available foods for the treatment of diseases [1]. Unlike adults, there is limited information about the use of natural products for neonates and infants that are less than six months of age. A difference in the physiological and pharmacological (pharmaco-kinetic and pharmacodynamics) aspects between infants and adults in drug metabolism is critical. These differences can cause numerous toxic effects when neglecting the change in dose and duration of use about body weight of neonates and infants [2, 3]. In the first months of an infant's life, parents may be unaware of their infant's suspected allergies that can arise from different products [4]. Some

of the natural products can cause allergies like fennel and chamomile. An anaphylactic shock can be caused by chamomile in individuals who are allergic to members of the Compositae family (e.g., ragweed, chrysanthemum and chamomile) [4, 5]. Natural products can be of benefit when it is well prepared, carefully selected and rationally used. Nevertheless, increasing the frequency of these useful natural products can cause toxic effects [3]. In the first months of life, most of the newborns suffer from many conditions which may disturb the baby and make the mother upset [6], some of the mothers tend to use traditional medicine which is useful in conditions for adults. This beneficial use of these natural products led them to expect the same benefit for their babies [3]. This impression might be misleading because not all of these natural products are safe to be given to babies [5, 7-9]. The source of the herbs is very important because adulteration and contamination of herbs can cause serious adverse effects [10]. To the best of our knowledge, there are no previous published studies in Libya to evaluate the use of natural products by mothers in neonates, infants or children, thus, the purpose of this study was to measure the extent of use of the natural products by mothers for their infants, and to investigate knowledge of mothers about giving the correct natural product for the right condition when they face a daily basis problem, which source they rely on to get the information from? and which source they purchase these natural products from.

Materials and methods

Questionnaire-based survey: The study was a questionnaire-based survey performed and designed as a face-to-face survey conducted between March and October 2021 in Tripoli, Libya. The time required to fill out the questionnaire was set as five min. This study was approved by the Department of Pharmacognosy, Faculty of Pharmacy, University of Tripoli, Tripoli, Libya (2021). With regard to the sampling technique, the survey included 152 mothers of children from day one birth to one year old who were admitted to Tripoli University Hospital, National Oil Corporation Clinic, As-Safwa Hospital and Jalaa Maternity Hospital. The response rate of the total distributed questionnaire was 98.1%.

Data collection: Data were collected using a face-to-face survey in the form of a structured validated questionnaire to collect data from the previously mentioned hospitals and clinics. The questionnaire was made up of 23 questions. They were divided into different parts: Participants' demographic data: age in years, educational levels, current place of residence and baby arrangements. Questions about the awareness of using natural products for infants. The natural products illustrated are: chamomile, peppermint, funnel, anise and honey. These natural products are commonly used in Libya.

Statistical analysis: Data were presented by descriptive statistics and were analyzed by inferential statistics. Data was analyzed by the following tests: Wilcoxon signed ranks test and Friedman test for differences between the groups. The association between the parameters was calculated by test of Spearman to find the degree of association between the observed parameters. A Microsoft Excel program 2019-SPSS 22 was used to analyze all the present data.

Results

In this study, 68.0% of mothers who filled out the survey had used natural products for their infants, 53.0% of them were aged from 20-30 years old, and 43.0% were 30-40 years old. 63.0% of them where live in Tripoli and the rest live in other different cities. 52.0% were of an undergraduate level of education, 46.0% were graduates from university and 02.0% were postgraduates. 75.0% of the infants were aged about three months or younger. The majority of the participants gave the natural products for 1-3 days (71.0%), 84.0% acquired their information from their families, and 08.0% acquired their information from doctors or pharmacists. 47.0% of the participants had purchased the products from pharmacies while 42.0% from herbal stores. The

percentage of use of each natural product alone was as follow: 78.0% chamomile, 63.0% pepper-mint, 52.0% fennel, 44.0% anise and 29.0% for honey. Only 17.5% of the mothers did not have enough knowledge about these natural products.

Upon asking them about the reason or the purpose of using these natural products was it to, relieve colic or flatulence? Enhance immunity? Or to increase the appetite? The answers were: for relieving colic 45.6% were good and 19.4% were very good, respectively. The rest answers were that they might have little effect on relieving colic, a minor percentage was that these products can not relieve colic. In the group of questions for the use of natural products for enhancing an appetite, answers were first for honey (53.3%) answered no, while the rest (46.6%) believed honey effects on enhancing appetite. While (chamomile, anise, mentha) most of the participants (64.6%) said that they did not use it to enhance their appetite, 35.5% of the participants believed that these products can enhance it either little, good or very good whereas fennel the greatest percentage 51.9% and answered no, as for the remaining 48.1% did use it to enhance the appetite. The following group of questions was about using these natural products to increase immunity, regarding honey, 43.3% of the participants believed that it has a good or very good effect on increasing it, while 30.0% said that they did not use it to increase the immunity and the remaining percentage said it has a little effect on increasing it. Regarding, Chamomile, anise and mentha, the majority (52.0%) said they do not affect on increasing immunity while the other percentage was divided between little, good and very good effects. With regard to fennel, 44.4% of the participants answered no, and the others (55.6%) were divided into different proportions between little, good and very good effects on increasing immunity. The last group of questions was about whether using these products can help relieve flatulence, as for honey the majority believed it is good in relieving flatulence (46.7%), only 06.7% answered with no while the participants who used chamomile, anise or mentha (71.7%) answered good and very good effect on relieving flatulence, 22.2% of the participants thought that they might have a little effect on relieving the flatulence, as for the fennel (74.0%) answered good and very good effects on relieving flatulence, 18.5% of the participants thought that it might have a little effect on relieving the flatulence. Upon asking them if any of these natural products might cause any harm to their infants, 73.7% for honey, 81.5% for fennel and 70.0% (chamomile, anise or mentha) answered no (i.e., they did not expect any harm). In **Figure 1**, with regard to the level of awareness of mothers using natural products, the degree of awareness of all the natural products combined: a statistical analysis by Friedman test revealed a highly significant difference ($p < 0.005$) by these findings. It can be said that there is no awareness in the community on how to use these natural products. With regard to the degree of awareness of each natural product alone: analysis by Wilcoxon signed rank test revealed highly significant ($p < 0.005$) by these findings. It can be said that there is a difference in the level of awareness for each product alone even though there is no awareness when they are combined. The level of awareness of using fennel is slightly lower than the rest of the natural products. This means that the degree of harm that might arise from the use of it is lower, as shown in **Figure 1**.

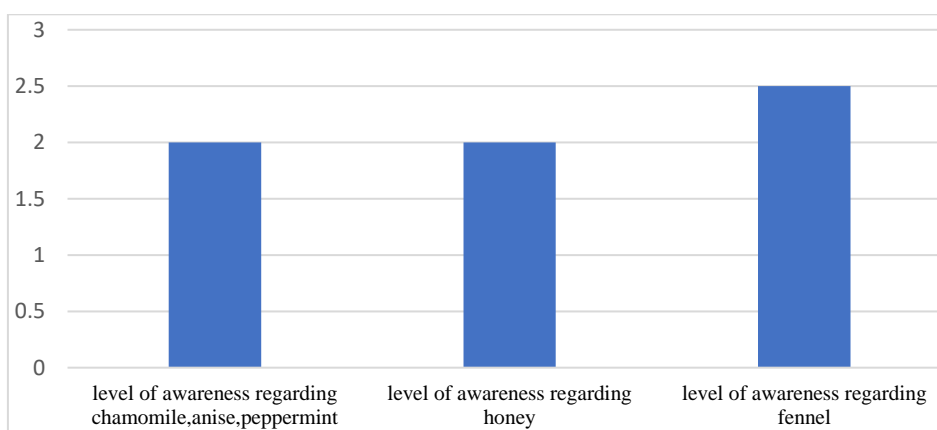


Figure 1: Degree of awareness of each natural product alone

When using Spearman's correlation test to find if there is a correlation between the participants' demographic data and the question which measures the level of mothers' awareness, an analysis of the data revealed there is no correlation between the two criteria except between the fennel and the education level, $r=0.033$, $p<0.05$. This means a positive significant correlation between the investigated parameters.

Discussion

Herbal medicine is the most commonly used complementary and alternative medicine [11], mothers over the years used herbal medicine to encounter some of their infant's daily health problems. The present survey included 152 mothers, 78.0% of them used chamomile, 52.0% used fennel and 44.0% used anise, but they used these natural products mainly to treat digestive system disorders such as colic and flatulence. However, few mothers rely on doctors or pharmacists to get their information (08.0%) which resembles the results of a study consisting of 202 mothers who applied to family health in Turkey [12]. Mothers used, fennel, chamomile and anise tea, to treat children's symptoms of digestive system disorders and sleep problems. Few mothers used herbal supplements with the advice of doctors [12]. This study supports the notion that mothers commonly use these natural products to treat digestive system disorders with few mothers relying on doctors/pharmacists to get their information from. More than half of the mothers in our survey used chamomile, mentha or anise for treating or to relieve their infant colic (65.0%). This effect has been verified by many other studies. Thus, in the case of chamomile upon asked them about the reason for using it and the main reason was for treating colic. The effects of chamomile on treating colic were proven by several studies including a double blind, randomized, placebo-controlled study (2015), performed on 93 breastfed infants which suffer from colic, after one week the crying time was reduced in 85.0% of the infants treated with a mixture of herbs (*Matricariae recutita*, *Foeniculum vulgare*, *Melissa officinalis*) and about 50% in infants treated with the placebo [13]. In our survey, with respect to menthe, mothers mainly used it for treating colic and flatulence which is confirmed by a double-blind crossover study (2011) including 30 infants to see the effectiveness of *Mentha piperita* versus simethicone in the treatment of colic in infants. Infants have taken each product for seven days, the results state that both drugs decrease the frequency of colic which is in line with Alves et al. [14]. Anise has a lot of beneficial effects. It is used as medicinal tea as anti-gas medication in newborns, infants and children [15]. About 30.0% of the mothers who filled the present survey have given honey to their infants, and about 75.0% of them thought that honey can not cause any harm to infants. A case report in 2012, UK, of a baby girl three months of age was presented with acute onset of generalized floppiness; tests were done and confirmed the botulism toxicity secondary to honey ingestion [7]. Another two severe cases of infants were hospitalized in the ICU, in France, the risk factor is the ingestion of honey [8]. These three cases shows that false information about honey use for infants can cause severe health problems. The prominent age group is less than three months, (75.0%), meaning that mothers are more likely to give natural products at the first months of life of their babies without knowing that these months are the most critical. Indeed, data collected in the present survey, about half of the mothers who filled out the survey have given fennel to their infants, and about 80.0% of them thought that fennel can not cause any harm to their infants. Studies in Iran performed on female mice showed that the exposure to fennel extract at the neonatal stage affected the reproductive organs causing early puberty, disturbance in the estrus cycle, imbalance in hormones and change in weight of reproductive organs due to phytoestrogens present in fennel [5, 9]. It is unclear if these effects and changes on mice at the neonatal stage can be seen in human babies, so caution must be taken when handling these phytoestrogens in newborns. In our survey, half of the mothers purchased natural products from pharmacies, while others from Herbal stores. Thus, 70.0% of mothers thought chamomile could not cause any harm. It is true if the source of chamomile is pharmacies (wrapped chamomile), in the other hand, unwrapped chamomile can cause infant botulism because it may contain (*Clostridium botulinum*) spores as was shown in a previous study that 200 samples of chamomile were

collected and analyzed to investigate the spore load of *C. botulinum* in chamomile, 07.5% of the samples were contaminated with spores and the prevalence of these spores has significantly been higher in unwrapped (sold by weight chamomile) than the ones sold in tea bags [16].

Conclusion: Libyan mothers have no awareness of how to use natural products and there is no correlation between demographical parameters and the way mothers use these natural products.

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Data availability statements: The raw data that support the findings of this article are available from the corresponding author upon reasonable request.

Author contributions: NOE & LAM collected data and contributed to analysis of data with drafting the manuscript. SEE analyzed data and drafted the manuscript. MAS contributed to the conception, compilation of data and drafting of the manuscript. All authors approved the final version of the manuscript and agreed to be accountable for its contents.

Conflict of interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Ethical issues: Including plagiarism, informed consent, data fabrication or falsification, and double publication or submission were completely observed by the authors.

Author declarations: The authors confirm that all relevant ethical guidelines have been followed and any necessary IRB and/or ethics committee approvals have been obtained.

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