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SHORT COMMUNICATION

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Knowledge, Attitude and Practice of Measuring Devices of Oral Liquid Medications in the Population of District East Karachi, Pakistan

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Abstract

Background: Most of the people have poor knowledge and inability to administer liquid medications properly which can lead to medication errors and poor health outcomes as laymen and even health care professionals hardly know about the differences among teaspoon (5ml), tablespoon (15ml) and other measuring devices which have great differences in volumes. **Objective:** To assess knowledge attitude and practice of measuring devices in the population of district east (Gulshan Iqbal and Jamshed Town) Karachi. **Methods:** A descriptive survey was conducted and total 98 participants were interviewed and information's were collected on designed questionnaires proforma. **Results:** In current results cough syrup were used (74.40%), antacids (12.24%) and (20.40%) multivitamins syrups with different measuring measuring devices such as teaspoons (61.22%), table spoons (33.67%) and other oral cups, syringes and dropper (7.14%) and (25.51%) people had experienced with wrong doses and suffered from ADR's. **Conclusion:** Awareness and consciousness about appropriate dosing is important in the use of oral liquid medication, the current study was planned to examine the dosing accurateness of measuring devices used for liquid oral medications above an extensive series of dosing volumes.

Key Words: ADR's, Teaspoons, Tablespoons, Pharmacist, Pakistan.

INTRODUCTION

In Pakistan the data regarding use of measuring its devices using for oral liquid dosage form is very rare. Need proper attention in order to provide basic information's regarding use of oral liquid medication. Liquid preparations are frequently use in infants, adolescence and even in geriatrics. Slightly deviations from normal dose may lead to fatalness. Parents are responsible for correct dose to their children. Medicines has no harm till to administration and improper spoons out doses owed to medication errors.[1-3] Medication errors may not be fully eradicated but the possibility of error

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happening can be minimized.[3-4]

Now a day's Medication errors have alarming signals via use of medications children's are more vulnerable to medications errors (WHO 2007).[4] In the United States every year at least 1.5 million preventable adverse drug events are reported and each year in hospitals 44000 - 98000 people die due to medical errors.[5-6] The 1999 report of Institute of Medicine (IOM), *To Err is Human*: *Building a Safer Health System*, depicted public responsiveness to the importance of patient safety.[7] Variability were measured as a result Products studied included 99% of the US marketplace part for nonprescription liquids. (74.0%) comprised a measuring device, generally a dosing cup (83.1%). For infants and children measuring device provided (94.9% vs. 60.7%) and with those provided by large industries (95.2% vs. 46.3%). Its feasibility varied by drug group: cough/cold (71.1%) analgesics (95.5%); combination (92%); and gastrointestinal (50.0%, allergy (90.0%).[8]

Improper use of paracetamol, Ibuprofen 50% children are presented to emergency department though understanding given insert information's of the prescribe medication an pouring to suitable measuring of liquid medications accurately Consequently, suspensions would usually by shaking re-dispersed.[9][10] The Consumer Healthcare Products Association (CHPA) praised reporting to FDA regarding OTC pediatric liquid medications containing acetaminophen to increase safe and effective use of acetaminophen because it inappropriate use may cause liver damage.[11] Another medicine Clonidine suspension is mostly prescribed to children and the overdose of Clonidine in children has resulted in major clinical circumstances and lead to deaths.[12,13] According to FDA (Food and Drug Administration) calibration for measuring devices should be within value of ±5% which is assigned for Measuring Devices, Packaging, Medication Safety Containers.[14]

MATERIALS AND METHODOLOGY

Study setting: A study was conducted for a periods of 4 months (January to April, 2015) to find out knowledge, attitude and practice of measuring devices at district east (Gulshan-E-Iqbal and Jam shed town) Karachi. *Study Population/Participants:* Different hospitals, Universities, Nurses colleges and general population of Gulshan-E-Iqbal town and Jamshed town in Karachi were visited, interviewed and information's were collected to determine the true population who lack the essential skills regarding spoon out the dose of oral medications, approximately 98 participants was included in the study and during interview we also kept different domestic measuring devices (tea spoons, tablespoonful, oral cups, syringes and dropper) samples showed to participants for the conformation the range of volumes from their daily used utensils as showed in Figure 1. We surveyed whether use of "teaspoon" or "tsp" "teaspoonful" or "tsp." and other instructions like use of cups, syringe on prescription sticky label upsets parents' choice of dosing apparatuses includes with medication products, and the title role of health illiterateness, knowledge and language and past experience may useful to get rid from medication errors.

Variables of the study

Four variables were studied in our study. a) Socio

Figure 1: a) Liquid oral measuring devices commonly used in the home of different sizes i.e. cylindrical, spoon, teaspoon, table spoons b) syringe, dropper, of pharmaceutical products and oral dosing cups.

Table 1: Total population participated in the study

Gender	Frequency	Percent	Prof; Students	Lay people	Nurses
Male	50.00	51.02%	36.00(36.73%)	8.00(11.22%)	10.00(10.20%)
Female	48.00	48.97%	35.00(35.71%)	4.00(6.12%)	5.00(5.10%)
Total	98.00				

demographic factors, b) Ability understands to measure the correct dose of oral liquid medications, c) Knowledge attitude and practice of suitable measuring devices to measure liquid medication especially tea spoons table spoons and others and d) Ever experience with adverse drug effect while taking wrong spoon out dose.

Socio demographic data of participants

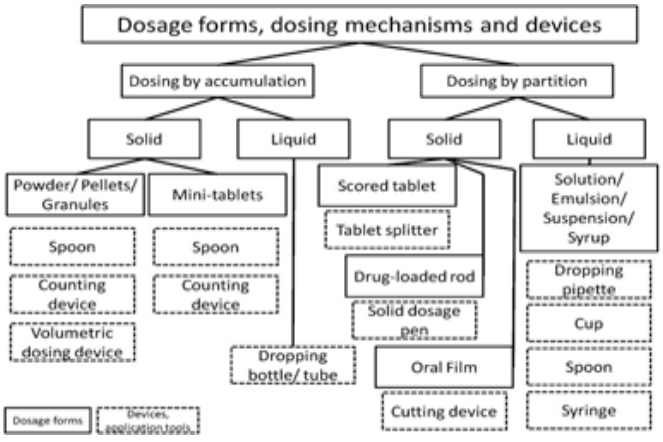
Questionnaires comprised of 21 questions were used for the collection of information. Collected data included age, gender, weight, occupation and area address. Data were analyzed and Microsoft excel (2016) were used to describe the data and charts presents the data accurately. The study approved by Department of Pharmacy, Quaid-i-Azam University, Islamabad, Pakistan. All the participants were informed by the consent form that their participation is voluntary and their name and knowledge will be kept anonymous.

RESULTS

Demographic Data

All participants were from District east (Gulshan and Jamshed towns) Karachi. Ages ranged between 25 and 80 years, with SEM 19.219 ± 25.2 weight of the participants were also recorded. Only 15.3% were uneducated and laymen and the remain 84.7% were educated including professional students 71%, staff nurses 15.3% both male and female population had past experience of administering liquid medicines like cough, multivitamins and antacids syrups and spoons out the dose also ever experience from adverse drug reactions from such wrong doses (Table 1).

Classes of drugs most commonly used in liquid dosage form[16]



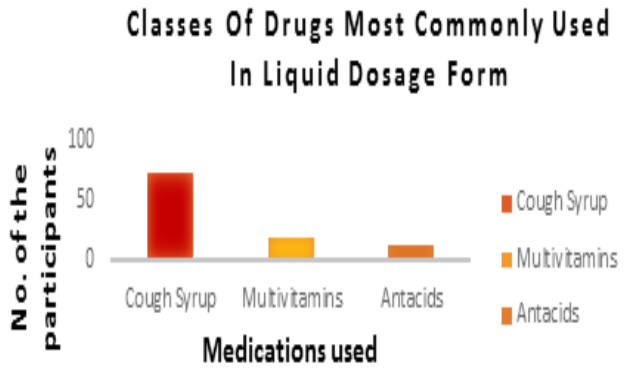


Figure 2: Classes of drugs most commonly used in liquid dosage form

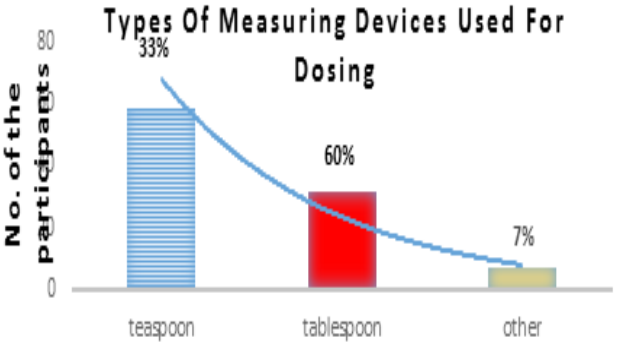


Figure 3: Types of measuring devices used for dosing.

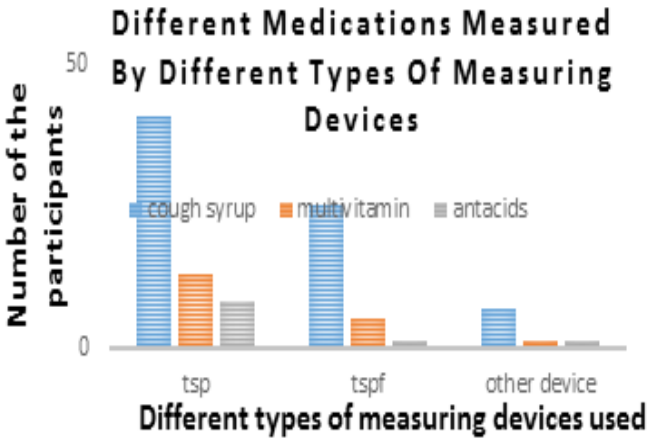


Figure 4: Relation between types of spoon used for class of liquid drug.

People are used to different oral dosage forms for treatment of illness. In our study targeted classes of medications were cough, multivitamins and antacids syrups by different measuring devices, SEM 1.140 ± 35. Cough syrup were used 74.40%, 12.24% used antacids and 20.40% were used multivitamins syrups on different measuring tools. (Figure 2)

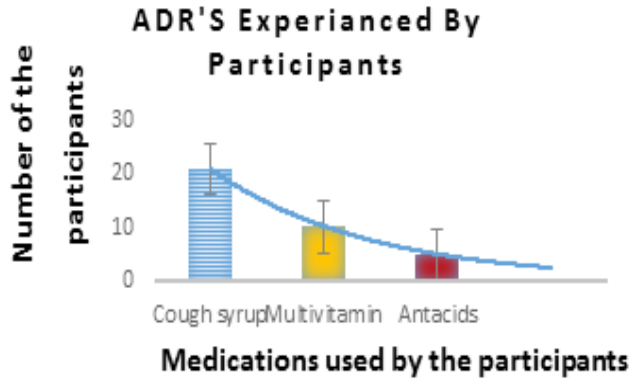


Figure: 5 Participants ever faced ADR's from over dose of medications

Type of spoons and other measuring devices used for class of liquids oral drug

Different types of spoon were used by the participants in past and knowledge regarding types of spoons were used and SEM 3.40 ± 17.78.in total sample population 61.22% were used tea spoons, 33.67% were used usually table spoonful and 7.14% were used other oral cups, syringes and dropper measuring tools for pouring of liquid oral dose as we shown them all measuring devices so they easily recognized measuring tool and we collected the data (Figure 3 and 4).

Ever experienced with adverse drug reactions due to excessive wrong dose of medications

Our focus to evaluate that how much people were experienced in past with wrong dose and were leaded to adverse drug reactions so SEM 3.77 ± 14.74 so many people were suffered total 25.51% were suffered moderate to Sevier adverse drug reaction from oral liquid medications experienced in the past 6 months (Figure 5).

DISSCUSION

Ever since medications are existing in different doses, it is precarious that doctors prescribe the accurate dose and pharmacists fill the exact dose of medication for each and every single patient. However, doctors and pharmacists are not the only ones who make errors with medication dosages. In fact, adults fairly often make dosing errors by spoon out the incorrect dose[15]

Figure 7.[16] General classification of oral dosage forms and dosing approaches for individualized therapy

In 1975 American Academy of Pediatrics (AAP) Committee on Drugs study, stated that 75 % household teaspoon or kitchen utensils measuring spoon were used by patients at the time of dosing liquid medication,[17] from Israel, in another study medications to children were given 80 % by household teaspoon.[18] In 2000 a related reported from Minnesota (USA) showed that (73 %) most frequently used of household teaspoon was for measuring liquid medications (Madlon-Kay and Mosch 2000). Food and Drug Administration United States (FDA) have also informed that patients should put away their domestic spoons and use a more correct measure whenever taking liquid medications.[19] In1992 a study of dosing errors reported to poison control centers found that failing to differentiate between teaspoons, tablespoons and correct oral dosing measuring device was a main cause for overdosing of cough and cold medicines and liquid acetaminophen. Although too much cough medicine is normally not a foremost health concern, many liquid medications contain acetaminophen, the active ingredient in Tylenol. Acetaminophen overdose is a principal health worry and can intimate to severe illness, liver failure and even death, while small dosing errors may not seem like the major concern.[20] Many people still use kitchen spoons and other domestic measuring devices for a dose of liquid medication. The capacity of household teaspoons ranges from 1.5 ml to 9 ml, potentially leading to errors in dosing. The size of the spoon influences our ability to estimate the right dose and most of the time, we get it wrong.in hospitalized patients nurses has the responsibility of measuring the dose accurately at the time of dose of pediatric patient.[21] The dose seems smaller on a larger spoon, which leads to overdosing. That is where the real danger lies. Sadly, parents are often responsible for their children overdosing because they generally believe they can estimate the proper dose by using a kitchen spoon. Interestingly, dosing errors reported to poison control centers continue to occur because people fail to distinguish between a tablespoon and teaspoon[22] Inappropriately, many people cannot tell how much five milliliters measures, which is why it is scary that many parents are confident in their ability to estimate a medication dose using a household spoon. This is why our **pharmacy error attorneys** urge parents to always use a measuring dropper, syringe, or measuring cap than relying on a kitchen spoons.

Though a smaller amount severe than overdosing in expressions of morbidity, lower than under dosing is identified to prime to useless therapy, drug resistance and needless common clinical visits.[23,24]

CONCLUSIONS

All the orally ingested liquid containing curative products (e.g., elixirs, suspensions, solutions, syrups) should be delivering with a device for measuring exact dose instead of using common device etc at home. As for as in developing country including Pakistan most of the population using spoon and dosing cups for measuring doses of liquid formulations. Subjects were more likely to measure an acceptable dose with an oral syringe when compared with a dosing cup. However a large proportion of participant in this study were unable to know about adjustment of doses through these available devices. So it is the responsibility of community pharmacist in order to counsel the patient or patient attendant at the time of dispensing in order to facilitate them. Beside this also very important for pharmacist to arrange seminar, distribute pamphlet in the community regarding the devices using in measuring oral liquid formulation like calibrated cups, droppers, syringes, spoons. One of the main reasons of treatment failure is due to unawareness of measuring proper doses. So it is the responsibility of all health care professional including physicians and nurses to provide proper knowledge to patient regarding use of oral liquid medications.

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CONFLICT OF INTEREST

No conflict of interest.

ABBREVIATION USED

FDA: Food and Drug Administration United States. CHPA: Consumer Healthcare Products Association. IOM: Institute of Medicine.

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