

Assessment of knowledge, attitude and practice of Ecopharmacology among MBBS students in a tertiary hospital in North India

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Abstract

Background: Ecopharmacology is the science concerned with the entry of chemicals or drugs into the environment through any route and at any concentration disturbing the balance of ecology as a consequence. The present study was conducted to assess knowledge, attitude and practice of Ecopharmacology among MBBS students in a tertiary hospital in North India. **Materials & Methods:** 135 MBBS students of both genders were provided with the questionnaire to assess knowledge, attitude and practices regarding ecopharmacology. **Results:** 72% were aware of Eco pharmacology, 68% knew that these drugs can cause environmental (water and soil) pollution, 85% replied that they read reports regarding effects of drugs pollution on environment, 90% replied yes that environmental pollution by drugs can lead to antibiotic resistance and cumulative toxicity, improperly disposed drugs pose hazards to public safety and correct response was given by 88%. The difference was significant ($P < 0.05$). 56% buy drugs in bulk for family members and 44% not, 20% pour leftover syrup/lotion from the bottle in the wash basin and 80% not and 25% remove the drug from its container before throwing in the garbage and 75% not. The difference was significant ($P < 0.05$). **Conclusion:** There was sufficient knowledge of methods of safe disposal of unused drugs.

Key words: Eco pharmacology, Knowledge, Practice.

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Introduction

The presence of medicinal products in the environment is a globally emerging issue. Ecopharmacology is the science concerned with the entry of chemicals or drugs into the environment through any route and at any concentration disturbing the balance of ecology (ecosystem), as a consequence[1]. Ecopharmacology is also referred to as environmental pharmacology or ecopharmacostewardship[2]. Studies have shown that households either threw the materials in the garbage or rinsed them down the toilet or sink. Over 7% did not dispose their unused medications, creating a household stockpile that may lead to accidental or deliberate wrongful ingestions. Drugs are usually water soluble and therefore find their way into the sewage[3]. This has added an altogether new dimension of Ecopharmacology. Pharmaceutical ingredients are excreted either as parent compound or metabolites from patient into the environment which can enter food chains and concentrate as they move upward into larger predators[4]. These drugs pass out of the system either as metabolites or unchanged through excretion. These drugs are found in traces in environment, mostly in water[5]. Various factors for drug

Results

entry into environment include consumption, incorrect disposal and through effluents of pharmaceutical companies. There are guidelines for pharmaceutical waste management for the manufacturing units, pharmacists and consumers[6]. The present study was conducted to assess knowledge, attitude and practice of Ecopharmacology among MBBS students in a tertiary hospital in North India.

Materials & Methods

The present study comprised of 135 MBBS students of both genders. All gave their written consent to participate in the study. The demographic information such as name, age, gender etc. was recorded. The questionnaire was designed which consisted of two sections. Section one was demographic data and section two included questions related to participants knowledge, attitude and practices regarding ecopharmacology. The questionnaire consisted of questions out of which 3 were open ended & remaining were close ended. Response from each student was recorded and subjected to statistical analysis. P value less than 0.05 was considered significant. P value less than 0.05 was considered significant.

Table 1: Distribution of subjects

Total- 135		
Gender	Male	Female
Number	60	75

Table I shows that out of 135 subjects, males were 60 and females were 75.

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Table 2: Knowledge about Ecopharmacology

Questions	Number	P value
Are you aware of Ecopharmacology?		
Yes	72%	0.02

No	28%	
These drugs can cause environmental (water and soil) pollution?		
Yes	68%	0.03
No	32%	
Do you read reports regarding effects of drugs pollution on environment?		
Yes	85%	0.01
No	15%	
Environmental pollution by drugs can lead to antibiotic resistance and cumulative toxicity?		
Yes	90%	0.01
No	10%	
Improperly disposed drugs pose hazards to public safety?		
Yes	88%	0.01
No	12%	

Table 2 shows that 72% were aware of Eco pharmacology, 68% knew that these drugs can cause environmental (water and soil) pollution, 85% replied that they read reports regarding effects of drugs pollution on environment, 90% replied yes that environmental pollution by drugs can lead to antibiotic resistance and cumulative toxicity, improperly disposed drugs pose hazards to public safety and correct response was given by 88%. The difference was significant (P< 0.05).

Table 3: Attitude about Eco pharmacology

Questions	Number	P value
Do you the method of disposing drugs?		
Yes	70%	0.02
No	30%	
There should be guidelines for public for ecologically safe disposal of drugs?		
Yes	80%	0.01
No	20%	
There should be safe medicine disposal locations?		
Yes	81%	0.01
No	19%	
Manufactures and pharmacies should have drug take back schemes?		
Yes	72%	0.01
No	28%	

Table 3 shows that 70% knew correct method of disposing non- used drugs, 80% replied that there should be guidelines for public for ecologically safe disposal of drugs, 81% replied that there should be safe medicine disposal locations and 72% thought that manufactures and pharmacies should have drug take back schemes. The difference was significant (P< 0.05).

Table 4:Practices about Eco pharmacology

Questions	Variables	Number	P value
Do you buy drugs in bulk for family members?	Yes	56%	0.94
	No	44%	
Do you pour leftover syrup/lotion from the bottle in the wash basin?	Yes	20%	0.01
	No	80%	
Do you remove he drug from its container before throwing in the garbage?	Yes	25%	0.02
	No	75%	

Table 3, Fig 1 shows that 56%buy drugs in bulk for family members and 44% not, 20%pour leftover syrup/lotion from the bottle in the wash basin and 80% not and 25%remove he drug from its container before throwing in the garbage and 75% not. The difference was significant (P< 0.05).

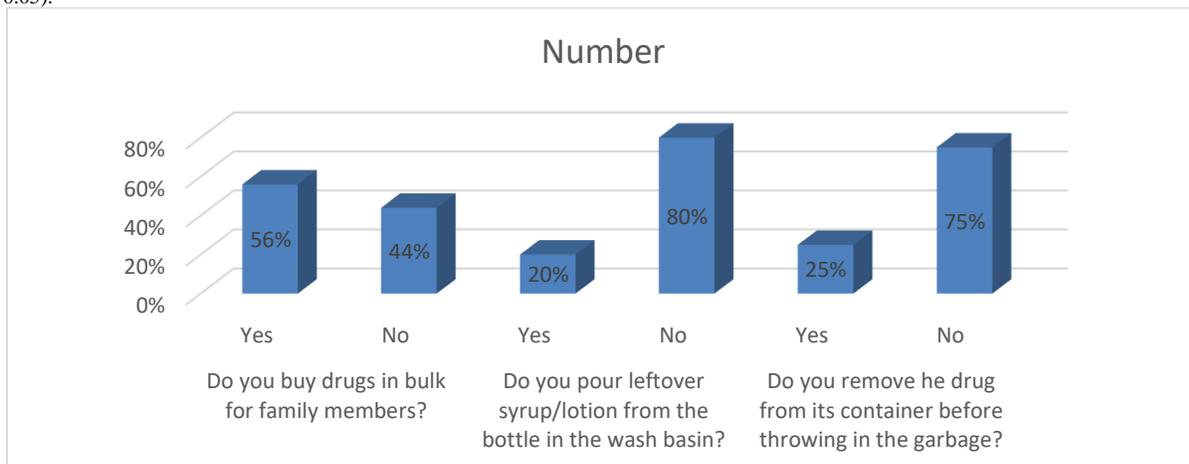


Fig 1:Practices about Eco pharmacology

Discussion

The presence of medicinal products in the environment is a globally emerging issue[7]. Ecopharmacology is the science concerned with the entry of chemicals or drugs into the environment through any route and at any concentration disturbing the balance of ecology (ecosystem), as a consequence[8]. Ecopharmacology is also referred to as environmental pharmacology or ecopharmacostewardship [9]. The present study was conducted to assess knowledge, attitude and practice of Ecopharmacology among MBBS students in a tertiary hospital in North India. In present study, out of 135 subjects, males were 60 and females were 75. 72% were aware of Eco pharmacology, 68% knew that these drugs can cause environmental (water and soil) pollution, 85% replied that they read reports regarding effects of drugs pollution on environment, 90% replied yes that environmental pollution by drugs can lead to antibiotic resistance and cumulative toxicity, improperly disposed drugs pose hazards to public safety and correct response was given by 88%. A study by Advaniet al[10] showed that 73% respondents had heard of term Ecopharmacology and majority (98%) felt that it was their responsibility to protect environment from pharmaceutical waste. Responses from 83% of participants indicated that they were worried about the excess medicines at their homes. 87% of participants threw it in garbage bin, but (58%) were unsure whether their drug disposing method was safe and 25 % knew it was unsafe. Most respondents (94%) felt that there should be guidelines for safe disposal of expired/unused drug and were enthusiastic about participating in campaign for this issue. Medical personnel also suggested some solutions to deal with this problem. We found that 70% knew correct method of disposing non- used drugs, 80% replied that there should be guidelines for public for ecologically safe disposal of drugs, 81% replied that there should be safe medicine disposal locations and 72% thought that manufactures and pharmacies should have drug take back schemes. Narasimhah et al[11] included a total of 165 participants (72 males, 93 females) from different batches of MBBS, predominantly 1st and 2nd year. Majority of them are aware of the term eco- pharmacology 70 (91%) and environmental effects 86 (06%). The most common mode of procurement is with prescription and possesses more than 50% of the expired drugs. Throwing back into the dustbin was the mode of disposal. We observed that 56% buy drugs in bulk for family members and 44% not, 20% pour left over syrup/lotion from the bottle in the wash basin and 80% not and 25% remove the drug from its container before throwing in the garbage and 75% not. Self-medication practices are more prevalent in India approximating 53.57% with NSAID's and anti-allergic drugs most frequently utilized for headache and cold. In addition, in a country like India which has no particular definition for over the counter drugs in its laws, the control on drugs that can be bought by the common man is very sparse. Even antibiotics can be bought

without a prescription. Though a number of regulatory bodies like the FDA and the European union have set some cut-off limit for environmental concentration of drugs, no actual testing is conducted after a drug is marketed to see if the environmental concentration was estimated correctly[12].

Conclusion

Authors found that there was sufficient knowledge of methods of safe disposal of unused drugs.

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