

*Full Length Research Paper*

## **Rational and experiential decision-making preferences of pharmacy students in Karachi, Pakistan**

**Wajiha Iffat<sup>1\*</sup>, Sadia Shakeel<sup>1</sup>, Atta Abbas Naqvi<sup>2</sup>, Shehlla Imam<sup>3</sup>, Tariq Ali<sup>1</sup>, Shagufta Nesar<sup>4</sup>, Riffat Yasmin<sup>1</sup>, Faaiza Qazi<sup>5</sup> Muhammad Faisal Khan<sup>1</sup> and Madeeha Khan<sup>5</sup>**

<sup>1</sup>Dow College of Pharmacy, Dow University of Health Sciences, Karachi 75270, Pakistan.

<sup>2</sup>Department of Pharmacy Practice, College of Clinical Pharmacy, Imam Abdulrahman Bin Faisal University, Dammam 31441, Saudi Arabia.

<sup>3</sup>Institute of Pharmaceutical Sciences, Jinnah Sindh Medical University Karachi, Sindh, 75510, Pakistan

<sup>4</sup>Department of pharmaceuticals, Faculty of pharmacy, Hamdard University, Karachi, Pakistan.

<sup>5</sup>Department of pharmaceuticals, faculty of pharmacy and pharmaceutical sciences, Karachi University.

Received 28 February, 2019; Accepted 17 June, 2019

**This study was conducted to examine the rational (systematic and rule-based) and experiential (fast and intuitive) thinking preferences of pharmacy students. This may assist in formulating learning and teaching tactics for decision-making leading to safe and optimized patient care services. Here, a validated psychometric tool, that is, the Rational Experiential Inventory (REI-40) survey was used. It was distributed to students studying in fourth and final years of pharmacy degree program in private as well as public sector universities of Karachi city. A composite rational score was obtained by adding responses from the rational ability (r-ability) and rational engagement (r-engagement) items, while a composite experiential score was obtained by adding the experiential ability (e-ability) and experiential engagement (e-engagement) items. Results revealed that the mean rational scores obtained were  $3.269 \pm 0.28$  for rationality,  $3.259 \pm 0.29$  for r-ability and  $3.289 \pm 0.28$  for r-engagement. Mean experiential scores were  $3.143 \pm 0.21$  overall,  $3.247 \pm 0.18$  for e-ability and,  $3.039 \pm 0.23$  for e-engagement. Influence of gender, year of study and, type of institute on students' responses was evaluated by applying independent t-test. The present study thus highlighted that most of the pharmacy students favored rational over experiential decision-making styles.**

**Key words:** Decision making, pharmacy students, rational engagement, experiential engagement

### **INTRODUCTION**

The World Health Organization (WHO) stresses on the need of pharmacists in patient care especially in developing countries. The role of a pharmacist in

healthcare has been established worldwide. This role has transcended from a conventional drug dispensing to direct patient care. Pharmacists are now involved in

\*Corresponding author. E-mail: [wajiha.iffat@duhs.edu.pk](mailto:wajiha.iffat@duhs.edu.pk).

direct patient care alone or as a member of the healthcare team to provide pharmaceutical care and clinical pharmacy services to the patients in the achievement of treatment outcomes. Besides, the drug information service is also provided by pharmacists. Kaboli and colleagues highlighted that pharmacists have an integral role in clinical care that involve carrying out medication reconciliation services, improved patient safety as well as adverse drug events (ADE) monitoring (Al-Tajir and Kelly, 2005; Kaboli et al., 2006). Thus, there is a plethora of studies that highlight the role of pharmacists in healthcare that requires sound clinical decision making (Phansalkar et al., 2009; Williams et al., 2016).

Evidence indicates that human reasoning operation constantly utilizes two cognitive approaches for processing of information. Experiential processing is characterized by fast, heuristic, associative, intuitive, recognition primed and automatic. The other mode known as rational processing gained by formal and cultural tuition utilizes conscious, slow, explicit, deliberate, rule-based, analytic and controlled (Stanovich and West, 2000). In the Heuristic-Systematic Information Processing Model, an approach used by a decision maker can either be simple heuristic decision approach or a systematic approach. The making of decision depends upon the extent of involvement of the person with decision (Chaiken, 1980). Factors that include dispositional, that is, individual and, situational, that is, environmental effects the association between experiential and rational reasoning approach. Participation in a simultaneous cognitive job, time pressure, time of performing tasks and mood tend to impair counteractive actions of the rational approach. The rational mode of operating positively correlates with intelligence, need for cognition and exposure to statistical training (Kahneman, 2003).

Clinical decision-making may not accommodate either or models well, because motivation is considered as fundamentally significant determinant of an individual's mode of processing. The more appropriate frame work for medical decision making Cognitive-Experiential Self Theory (CEST) involves equally an experiential and rational system control incessantly in an incorporated communication (Epstein, 2003). The model operates without emphasizing on importance of a judgment or decision maker's level of motivation.

Research studies have highlighted that individuals decision making style tends to switch from one mode to another and depends upon presentation of information and type of population under consideration for example, undergraduates or professional decision making style may be different owing to responsibilities, circumstances, resources, and common individual distinctiveness (Epstein, 2003; Phansalkar et al., 2009; Calder et al., 2011). This study aimed to examine the pharmacy student rational, that is, systematic and rule-based, and

experiential, that is, fast and intuitive, thinking preferences, that may provide an approach in formulating learning and teaching methods for decision making leading to safe and optimized patient care services.

## MATERIALS AND METHODS

A cross-sectional study was conducted in October 2015 among undergraduate students studying in fourth and final years of pharmacy degree program in private and public-sector universities in Karachi.

### Venue and duration of the study

The venue of the study was the pharmacy teaching institutes located in Karachi city. According to the literature, Karachi has three public-sector and six private sector universities. The total yearly intake of these institutes is estimated to be over 1200 students.

### Participants

The participants were the undergraduate students studying in their fourth and final year pharmacy degree program. Students studying in other degree programs were excluded. Those who did not consent to participate were also excluded from the study.

### Sample size and sampling procedure

Sample size was calculated through an online software and probability sampling technique was adopted. A total of 434 pharmacy students participated in the study.

### Research instrument

The study was conducted using a previously validated survey tool known as the Rational Experiential Inventory (REI-40) survey.

### Data analysis

The data was analysed through SPSS version 20 (IBM Corp, Armonk, NY). The continuous data were presented as mean ( $\bar{X}$ )  $\pm$  standard deviation (SD). An independent t-test was adopted to examine differences between groups.

### Ethics review and statement of consent

This study was exempted from review by the ethical committee. The participants were briefed about the study prior to handing the questionnaire. The participation was voluntary, and the questionnaire was handed to those who consented to participate.

## RESULTS

Out of 500 survey questionnaires, only 434 were returned giving a response rate of 86.8%. Most students were

**Table 1.** Characteristics of study population.

Characteristics	Number (Percentages)
<b>Gender</b>	
Male	77(17.74%)
Female	357(82.25%)
<b>Academic year</b>	
Fourth year	238(54.83%)
Final year	196(45.16%)
<b>Institute</b>	
Private	196(45.16%)
Public sector	238(54.83%)

**Table 2.** Comparison of rational-experiential inventory means of participants.

Demographics	Rational	R-Ability	R-Engage	Experiential	E-Ability	E-Engage
	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)
<b>Gender</b>						
Male(77)	3.257(0.295)	3.242(0.358)	3.272(0.232)	3.148(0.201)	3.244(0.212)	3.053(0.191)
Female(357)	3.238(0.274)	3.192(0.296)	3.284(0.252)	3.14(0.170)	3.243(0.160)	3.037(0.181)
<b>Academic year</b>						
Fourth year(238)	3.248(0.218)	3.207(0.170)	3.290(0.267)	3.123(0.165)	3.184(0.158)	3.063(0.172)
Final year(196)	3.313(0.361)	3.353(0.378)	3.273(0.345)	3.163(0.283)	3.316(0.213)	3.010(0.354)
<b>Institute</b>						
Private(196)	3.313(0.361)	3.353(0.378)	3.273(0.345)	3.163(0.283)	3.316(0.213)	3.010(0.354)
Public sector(238)	3.248(0.218)	3.207(0.170)	3.290(0.267)	3.123(0.165)	3.184(0.158)	3.063(0.172)

female (357, 82.25%) and belonged to public-sector pharmacy teaching institute (238, 54.83%). The majority of students (238, 54.83%) studied in fourth year (Tables 1 and 2). The mean rational score was 3.269±0.28 for rationality, 3.259±0.29 for r-ability and, 3.289±0.28 for r-engagement. Mean experiential score was 3.143±0.21 overall, 3.247±0.18 for e-ability and, 3.039±0.23 for e-engagement. Influence of gender, year of study and type of institute on responses was evaluated by applying independent t-test. No significant differences in decision-making styles were found among students based on gender except an 'experiential engagement statement', (p=0.002). Significant association was found between 'type of institute' and 'rational ability', (p<0.0001). R-Engagement included; 'thinking is not my idea of an enjoyable activity', p=0.002, 'learning new ways to think would be very appealing to me', (p < 0.0001), 'I enjoy thinking in abstract terms', (p < 0.0001) and, 'I don't like to have to do a lot of thinking', (p < 0.0001). The influence

on e-ability and engagement included, 'I don't have a very good sense of intuition', (p=0.036), 'I don't like situations in which I have to rely on intuition', (p=0.001), 'I don't think it is a good idea to rely on one's intuition for important decisions', (p=0.001), and 'I think it is foolish to make important decisions based on feelings', (p=0.028).

Significant association was found between 'year of study', and 'rational scores', that is, 'I have a logical mind and I usually have clear, explainable reasons for my decisions', (p < 0.0001), 'thinking is not my idea of an enjoyable activity', (p=0.002), 'learning new ways to think would be very appealing to me', (p < 0.0001), and 'I enjoy thinking in abstract terms and I don't like to have to do a lot of thinking', (p < 0.0001). Association was found significant between 'year of study' and 'experiential scores', that is, 'I don't have a very good sense of intuition', (p=0.036), 'I don't like situations in which I have to rely on intuition', and 'I don't think it is a good idea to rely on one's intuition for important decisions', (p=0.001).

## DISCUSSION

In Pakistan, the conventional pharmacy practice is still prevalent. Pharmacist's role is in transformation to address the demands of healthcare system. For the attainment of therapeutic benefits and achievement of clinical outcomes, understanding the pharmacy student's decision-making preferences would guide in developing educational strategies that could promote sound decision making for the safe and proper use of medicines by the patient.

This study was based on dual-processing theory and CEST proposing that decision making involves two independent modes that process and operate simultaneously and sequentially (Epstein et al., 1996; Epstein, 2003). In our study, prospective pharmacy students used both rational and experiential decision-making styles, which was similar to the study conducted on third year pharmacy student in the United States (McLaughlin et al., 2014). This novel study assessed REI in pharmacy students of Pakistan. The outcomes demonstrated that pharmacist preferred fact, order and logic over intuition. The results are consistent with studies using the Myers-Briggs Type Indicator (Hardigan and Cohen, 1999; Shuck and Phillips, 1999; McLaughlin et al., 2014).

A significant association was found between professional year and rational scores in our study. It reflected that Pharm. D program courses directed students to use systemic and analytical analysis for the evaluation of patient medication regimen appropriateness that encompassed several factors and considerations that were involved to ensure overall health status of the patient. As pharmacy students demonstrated rational thinking preferences. This highlighted the need to teach evidence based medicine strategies to support systematic and analytic decision making (Brown et al., 1995; McLaughlin et al., 2014; Williams et al., 2016).

In support of making clinical decisions in healthcare field, a balance between rational and experiential thought processes are required in time efficient way. Even though cognitive psychology has comprehensively explored issues underlying the decision-making process, the extent to which pharmacists rely on rational and experiential modes of information processing is not recognized well. The present study outlined pharmacy student decision-making style reflecting knowledge and skill obtained during classroom teaching of various pharmacy practice courses with special emphasis on clinical problem-solving skills to students in clinical practice. These decision-making skills helped simplify complex drug-therapy management and therapeutic dilemmas.

Our study had some limitations. The study highlighted the decision-making preferences of fourth and final year pharmacy students. To understand rational and

experiential decision making among pharmacists, the research should be carried out in workplace settings. It is also suggested that research must be carried out covering all the batches in the year to experience impact of the study. Therefore, future studies may be carried out to determine the decision-making preferences of pharmacists along a continuum of experience as likelihood of their dependence on the rational decision making may subside over time.

## Conclusion

Most of the student pharmacists in this study favored rational over experiential decision-making styles. In support of making clinical decisions in healthcare field, a balance between rational and experiential thought processes are required in time efficient way as pharmacists face a wide range of situations that require effective and appropriate decision making.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

## REFERENCES

- Al-Tajir GK, Kelly WN (2005). Epidemiology, comparative methods of detection, and preventability of adverse drug events *Annals of Pharmacotherapy* 39(7-8):1169-1174.
- Brown TE, Carter BL, Butler CD (1995). Using decision analysis to modify clinical decisions made by pharmacists and students *American Journal of Pharmaceutical Education* 59(1):14-19.
- Calder LA., Forster AJ, Stiell IG, Carr LK, Brehaut JC, Perry JJ, Vaillancourt C, Croskerry P (2011). Experiential and rational decision making: a survey to determine how emergency physicians make clinical decisions. *Journal of Emergency Medicine* 29 (10):811-816.
- Chaiken S (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of personality and social psychology* 39(5):752.
- Epstein S (2003). Cognitive-experiential self-theory of personality. *Handbook of psychology*.
- Epstein S, Pacini R, Denes-Raj V, Heier H (1996). Individual differences in intuitive-experiential and analytical-rational thinking styles. *Journal of personality and social psychology* 71(2):390.
- Hardigan PC, Cohen SR (1999). A comparison of osteopathic, pharmacy, physical therapy, physician assistant, and occupational therapy students' personality styles: implications for education and practice. *Journal of Pharmacy Teaching* 7(2):67-79.
- Kaboli PJ, Hoth AB, McClimon BJ, Schnipper JL (2006). Clinical pharmacists and inpatient medical care: a systematic review. *Archives of Internal Medicine* 166(9):955-964.
- Kahneman D (2003). A perspective on judgment and choice: mapping bounded rationality." *American psychologist* 58(9):697.
- McLaughlin JE, Cox WC, Williams CR, Shepherd G (2014). "Rational and experiential decision-making preferences of third-year student pharmacists." *American Journal of Pharmaceutical Education* 78(6):120.
- Phansalkar S, Hoffman JM, Hurdle JF, Patel VL (2009). Understanding pharmacist decision making for adverse drug event (ADE) detection." *Journal of evaluation in clinical practice* 15(2):266-275.

Shuck AA, Phillips CR (1999). Assessing pharmacy students' learning styles and personality types: a ten-year analysis". *American Journal of Pharmaceutical Education* 63:27-33

Stanovich KE, West RF (2000). Individual differences in reasoning: Implications for the rationality debate. *Behavioral and Brain Sciences* 23(5):645-65.

Williams CR, McLaughlin JE, Cox WC, Shepherd G (2016). "Relationship between student pharmacist decision making preferences and experiential learning." *American Journal of Pharmaceutical Education* 80(7):119.