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RESEARCH ARTICLE

# Purchasing Behavior and Customers' Response to the Intrinsic and Extrinsic Factors of the Pharmaceutical Products in Bangladesh

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## ABSTRACT

The prime objective of the study is to assess the purchasing behavior of pharmaceutical products among customers in Bangladesh and their response to the diverse range of intrinsic and extrinsic factors of the pharmaceutical products. Multi-item measures were utilized to collect information through a questionnaire-based survey to evaluate respondents' attitudes toward the distinctive characteristics of the pharmaceutical products. Among 410 participants, 266 respondents were assessed who purchase pharmaceutical products at least once monthly in last 1 year and answered all the questions properly. Shopkeepers' suggestions, product presentation, packaging material, product visibility, and packaging quality were singled out, which significantly impacted the purchasing behavior and brand evaluation. Significant gender differences were also observed in purchasing pharmaceutical products influenced by doctors' prescriptions ($\chi^2$ = 10.278, $P$ = 0.016) and evaluating brand based on bitterness of the taste ($\chi^2$= 6.792, $P$ = 0.034). The association of the academic level of the customers was also observed in the most deciding factor in purchasing pharmaceutical products ($\chi^2$ = 27.039, $P$ = 0.000) and evaluation of the brand based on company image ($\chi^2$ = 4.076, $P$ =0.043), color of the liquid dosage form ($\chi^2$ = 8.562, $P$ = 0.014), taste difference ($\chi^2$ = 11.346, $P$ = 0.023), and bitterness of the liquid dosage form ($\chi^2$ = 7.245, $P$ = 0.027). Regardless of gender and education level, the majority preferred transparent, dual packaging and strips of solid dosage forms that are marked with the days of a week.

**Keywords:** Brand evaluation, customer assessment, pharmaceutical industry in Bangladesh, purchasing decision

## INTRODUCTION

The pharmaceutical industry has emerged as one of the most growing sectors globally due to the increased health concern, modern lifestyle, and technological development.[1] These businesses across the globe are aggressively involved with the persuasive promotion of medical products.[2,3] As a least developed country, Bangladesh is not an exception, and it got an exemption from obligations to implement patents and data protection for pharmaceutical products until 2033. Bangladesh manufactures most of the generic drugs essential to ensure the proper health care of the people. According to the website of The Directorate General of Drug Administration under the Ministry of Health & Family Welfare, Government of the People's Republic of Bangladesh (collected from www.dgda.gov.bd, retrieved on January 8th, 2021), a total of 257 pharmaceutical companies have been registered to operate their activities in Bangladesh market, whereas 215 pharmaceutical companies are actively functioning. This large

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number of pharmaceutical companies is an indicator of vigorous competition in Bangladesh's pharmaceutical industry. These companies regularly assert various promotional activities to increase their sales, enrich customers' knowledge of healthcare, and improve the diagnosis and treatment of unrecognized illnesses.[4-6] One of the tools frequently used by pharmaceutical companies is offering gifts to persuade physicians to write prescriptions.[7] Some studies also found a higher prevalence of misleading claims in the promotional brochures of the pharmaceutical companies in Bangladesh.[8]

On the contrary, to enhance sales and provide more value to the shareholders, in some countries, drug manufacturers directly approach consumers through advertisement, which is commonly known as direct-to-consumer (DTC) advertising of prescription drugs.[9,10] However, access to DTC advertising of prescription drugs by pharmaceutical companies has been prohibited in most countries, including Bangladesh.[11] As there has been a restriction on DTC advertising, pharmaceutical companies put extensive effort into their product presentation and marketing activities to indirectly influence customers or consumers. They try to gather additional customer value by lucrative primary, secondary or tertiary packaging, product information, product size, shape, flavor, and color. Product price, positioning, distribution, and other marketing mix components also have a passive impact on customers' psychology. These marketing activities provide different types of newer views that impact customers' psychology and behavior. As a result, the psychological impact matters and plays a key role in consumers' minds during purchasing pharmaceutical products.[12]

Based on the customers' view, nowadays, customers apply their own preferences and choices while buying pharmaceutical products as there are various brands of choice in the sustaining market.[13] Over-the-counter (OTC) customers' behavior is normally influenced by a variety of factors, including prior experience and product price in Bangladesh.[14] Moreover, polypharmacy and self-medication is also common practice in Bangladesh. Rasu *et al*. also described the alarming practice of polypharmacy in Bangladesh earlier.[15] A recent study shows that more than 73% of people of Bangladesh practice self-medication in their medication practice to some extent.[16] People of Bangladesh intend to purchase medicine from the local medicine dispensing shop (which is generally known as a pharmacy shop) considering the suggestion of the salesmen or shopkeepers instead of consulting a registered physician/pharmacist.[17-19] In Bangladesh, to operate a pharmacy shop, a license is mandatory. But still, there are some unauthorized pharmacy shops present in the local areas which aren't run by registered or "A" grade pharmacists. As a result, suggestions from these shopkeepers may lead to serious medication errors as well as adverse drug reactions. Nowadays, using OTC drug is very prominent among people as they are busy with their work and unaware of the drug-drug, food-drug interaction. They tend to buy medicine by just asking the shopkeepers.[20,21] During this purchase, brand image has a substantial impact on the psychology of the consumer.

Consumers, in many cases, evaluate products on two varieties- one is extrinsic, and another is intrinsic.[22] Intrinsic varieties consist of physical and sensory characteristics of a product, particularly taste and flavor, that serve consumers' perceptions regarding a brand. Extrinsic varieties are external characteristics of a product, for example, price, the brand image of the product, the company image, and their influence on consumers' overview toward a brand.[23-25]

An extensive literature review reveals that researchers like Mb *et al*. analyzed, the impact of the packaging of OTC medicines on patients' purchasing behavior in Nigeria and found out that pharmaceutical packaging imparts a significant effect on consumer purchasing patterns.[26] It has been believed that companies capable of expressing a certain connotation through the esthetics of a product design can establish a competitive edge in the market and boost the product's likelihood of success.[27-29] Moreover, Gallan identified vital factors such as the influence of colleagues, medical representatives, medicine samples, and direct-to-patient marketing behind the prescribing behavior of health care professionals.[30] Other

researchers such as Hoyer and Stokburger-Sauer, Parvin and Chowdhury examined the influence of esthetic taste and different extrinsic aspects of non-pharmaceutical products on consumer behavior.[31,32] Although there has been a study in Bangladesh that highlights the impact of medical representative-based promotion of pharmaceutical products and the subsequent prescribing behavior of the doctors, there hasn't been any study focusing on the impact of packaging materials and the resultant pattern of prescribing as well as consumer buying attitude.[33] Our research is distinguishable in this regard that specifically addresses this issue.

In this study, for the 1st time, we focused on evaluating how customers made their buying decisions in Bangladesh while purchasing pharmaceutical products (whether they are OTC or prescription drugs). We also aimed to assess customers' attitudes toward the various intrinsic and extrinsic factors (such as size, shape, color, taste, flavor, and packaging quality) of pharmaceutical products during their purchase in Bangladesh.

## MATERIALS AND METHODS

### Study Design and Area

The study was conducted among the people of Dhaka, the capital city of Bangladesh. Data were collected through self-reported questionnaire-based surveys. The purpose of this study was clear, and written consent was obtained from the participants before the survey. All the participants were briefly explained the definition of pharmaceutical products, the difference between prescription drugs and OTC drugs, and the differences between consumer products and pharmaceutical products. We provided the questionnaire to the participants regardless of age, sex, economic status, or race.

### Sample

People from the different areas of Bangladesh gather to Dhaka (the capital city of the country) for their earning, education, and treatment as well. Participants were approached randomly in front of the different Pharmacy shops from the various locations of Dhaka who went to purchase medicine. All the participants were aged above 18 years old, regardless of culture, occupation, sex, status, caste, and creed. Initially, questionnaires were provided to 410 participants who agreed to participate. Among them, primarily 350 participants response was selected who used to purchase medicine more than once monthly. The rest of the responses were excluded from the study. Finally, the responses of 266 participants were considered for the final data analysis who answered all the questions thoroughly. This sampling process is illustrated in Figure 1. The responses were later grouped based on gender (male/female), and education level (<undergraduate/≥undergraduate) to determine the association of gender and education in customers' response to different intrinsic and extrinsic factors of pharmaceutical products.

### Questionnaire Preparation

The questionnaire was prepared in English for a proper understanding of the scientific terminologies. In addition, a Bengali translation was also provided (the native language of the country). A forward-backward translation of the questionnaire process was followed for finalizing the final questionnaire. The participants were given this questionnaire containing sixteen questions. The questions were structured and closed-ended with the option to put a tick mark, which was divided into three major

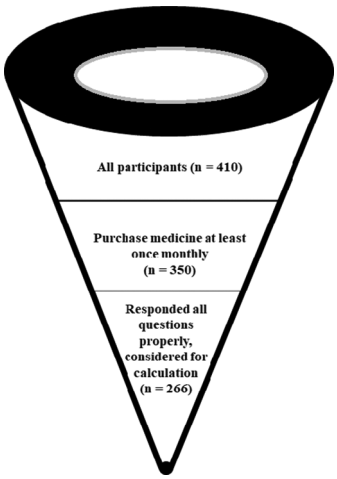


**Figure 1:** Schematic diagram of the selection of participants for data analysis

sections. The first section was prepared to gather demographic information of the participants such as age, sex, monthly income, and education status, and the latter parts contained relevant questions to identify buyer's decision making parameters and pharmaceutical product evaluation factors that drive them to buy any pharmaceutical products. After a thorough literature review, questions were set based on the product packaging standard, the advantage of secondary and tertiary packaging, product size, color, taste, flavor, etc. The questionnaire used to conduct this study is given in Table 1.

## Statistical Analysis

Different codes were given to all the responses of individual questions and analyzed using the SPSS version 21.00. Eventually, parametric and non-parametric statistical tests were applied, where required. Frequency tables were used to represent categorical variables, whereas measures of central tendency and dispersion were used to describe continuous variables (mean, median, and standard deviation.). The association between the categorical variables was assessed by applying the Chi-square test. Results were measured at a 95% confidence level (statistically significant when the $P < 0.05$).

## Ethical Considerations and Consent of Participants

Throughout the design and implementation of this study, ethical issues were considered very carefully. This quantitative observational study strictly followed the Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans at all the means of the investigation.[34,35] Other than these, before conducting this study, it received ethical approval from the Jagannath University, Dhaka, Bangladesh (reference no. JnURes-001/2019). The objective of the study was disclosed clearly to the participants once they had completed answering to avoid biased responses. All of them agreed and provided their consent to use their given feedback for further data analysis. The confidentiality and privacy of the participants were firmly maintained.

**Table 1:** Questionnaire used to conduct the study

| Question | Responses |
|---|---|
| Do you buy medicine showing the Prescription? | Yes |
| | No |
| Do you prefer buying pharmaceutical products of any specific pharmaceutical company? | Yes |
| | No |
| | Not concerned |
| Do you prefer purchasing a liquid dosage form of the pharmaceutical product based on color? | Yes |
| | No |
| | Not concerned |
| Do you feel irritated in having a pharmaceutical product for its bitter-tasting nature? | Yes |
| | No |
| | Not concerned |
| Which taste of liquid dosage form do you like the most? | Sweet |
| | Sour |
| | Sweet and sour |
| | Not concerned |
| | Other |
| Which flavor of liquid dosage form do you like the most? | Mango |
| | Banana |
| | Mixed fruit |
| | Not sure |
| | Other |
| Does the size of the pharmaceutical product influence your pharmaceutical product evaluation? | Yes |
| | No |
| | Not concerned |
| Does the shape of the pharmaceutical product influence your pharmaceutical product evaluation? | Yes |
| | No |
| | Not concerned |
| When you buy a pharmaceutical product, does the design of the packaging influence? | Yes |
| | No |
| | Not concerned |
| When you buy a pharmaceutical product, does the color of the packaging influence? | Yes |
| | No |
| | Not concerned |
| Do you prefer pharmaceutical products having double packaging (like- additional foil paper, pouch, etc.)? | Yes |
| | No |
| | Not concerned |
| During buying the pharmaceutical product do you prefer to have the packaging marked with the days of week? | Yes |
| | No |
| | Not concerned |
| Which type of bottle do you prefer for having liquid pharmaceutical products? | Amber-colored bottle |
| | Water colored bottle |
| | Not concerned |
| Which type of bottle material do you prefer most? | Glass type |
| | Plastic-type |
| | Not concerned |
| Which type of strips do you prefer for a tablet/capsule? | Opaque (Unclear) |
| | Transparent |
| | Not concerned |

*(Contd...)*

**Table 1:** *(Continued)*

| Question | Responses |
|---|---|
| Which one of the following influences you the most to purchase any brand of your pharmaceutical product? | Doctor's Prescription only |
| | Price of the brand |
| | Company of the pharmaceutical product |
| | Shopkeeper's suggestion |
| | Packaging Standard of the pharmaceutical product |
| | Other |

## RESULTS

A total of 266 correctly completed responses were considered for the final analysis of results in this study. Almost half of the participants ($n$ = 132, 49.6%; male $n$ = 70, 45.2%, female $n$ = 62, 55.9%) were aged between 18 and 24 years. Based on the education level, people who completed their undergraduate dominated the number of respondents ($n$ = 171, 64.3%). Of all, 130 (48.9%) participants had monthly income ≤BDT 10,000. The demographic characteristics of the participants are presented in Table 2. We presented our findings of making the purchasing decision and customers' response to the intrinsic and extrinsic factors of the pharmaceutical products in Tables 3-7.

In our findings [Table 3], we observed that the most influencing factor responsible for buying pharmaceutical products is the doctors' Prescription, accounting for about 71% of the total sample, followed by other factors such as shopkeepers' suggestions (14%) and company profile (13%). The Chi-square test also suggested significant differences in this buying behavior between males and females ($\chi^2$ = 10.278, $P$ = 0.016) and participants in terms of education level (below undergraduate vs. undergraduate and above), ($\chi^2$ = 27.039, $P$ = 0.000).

We also looked at the purchasing characteristics of the consumers [Table 4], focusing on company loyalty and the importance of showing the Prescription during purchase. We found that 66% of the participants did not buy any specific brand pertaining to company loyalty. A significant difference was observed between the groups based on the educational level while preferring any specific top-ranked pharmaceutical company to purchase pharmaceutical products ($\chi^2$ = 4.076, $P$ =0.043). On the other hand, the tendency to show prescriptions while buying pharmaceutical products was approximately similar to that of not showing with no significant difference between groups based on gender ($\chi^2$ = 0.110, $P$ = 0.740) and educational background ($\chi^2$ = 0.677, $P$ = 0.411).

Next, we focused on the sensory attributes of pharmaceutical products, such as color, taste, and flavor, and their impact on buying behavior of the consumers [Table 5]. In our results, we found that a large part of the sample (66%) did not purchase any liquid medicine based on specific color preference, while a considerable portion (22%) did not concern themselves with the color. While the majority of the participants agreed on the product profile based on taste (48% opted against bitter products and 65% chose sweet or sweet-sour products over others), a similar scenario could not be observed in the case of the flavor of the products (48% of the sample was not sure about flavor). Moreover, there were significant differences (significant at 95% confidence level) between groups based on educational status (in terms of color, bitterness, and sweetness profile) and gender (in terms of bitterness profile only). There were significant differences between less than undergraduate and undergraduate or above participants in evaluating a liquid dosage form of pharmaceutical product based on color ($\chi^2$ = 8.562, $P$ = 0.014), taste ($\chi^2$ = 11.346, $P$ = 0.023) and irritated feeling in bitter taste ($\chi^2$ = 7.245, $P$ = 0.027). Regarding feeling irritated by the bitter taste of the liquid dosage form, a significant difference ($\chi^2$= 6.792, $P$ = 0.034) was also observed between male and female participants.

We also examined the influence of the packaging of the product on customers' purchasing behavior [Table 6]. While factors like the design of the packaging did not show any impact on the majority of the group (57%), factors like double packaging (additional foil paper, pouch added with the primary packaging) and frequency of drug administration (number of days or weeks to be administered) play an important part during purchase (opted by 51% and 65% of the group

**Table 2:** Demographic characteristics of the participants

| Variable | Total | Male (%) | Female (%) | $\chi^2$ (*P*-value) |
|---|---|---|---|---|
| No. of participants | 266 | 155 (58.3) | 111 (41.7) | - |
| Age (years) | | | | |
| 18–24 | 132 (49.6%) | 70 (45.2) | 62 (55.9) | 3.144 (0.208) |
| 25–35 | 96 (36.1%) | 62 (40.0) | 34 (30.6) | |
| >35 | 38 (14.3%) | 23 (14.8) | 15 (13.5) | |
| Occupation | | | | |
| Student | 155 (58.3%) | 87 (56.1) | 68 (61.3) | 36.331 (0.00) |
| Service holder | 73 (27.4%) | 53 (34.2) | 20 (18.0) | |
| Self-employed | 19 (7.1%) | 15 (9.7) | 4 (3.6%) | |
| Unemployed | 19 (7.1%) | 0 (0.0) | 19 (17.1) | |
| Monthly income | | | | |
| ≤BDT 10,000 | 130 (48.9%) | 65 (41.9) | 65 (58.6) | 8.079 (0.044) |
| BDT 10,001–20,000 | 53 (19.9%) | 35 (22.6) | 18 (16.2) | |
| BDT 21,000–40,000 | 44 (16.5%) | 27 (17.4) | 17 (15.3) | |
| >BDT 40,000 | 39 (14.7%) | 28 (18.1) | 11 (9.9) | |
| Education | | | | |
| < Undergraduation | 95 (35.7%) | 55 (35.5) | 40 (36.0) | 0.009 (0.926) |
| ≥ Graduation | 171 (64.3%) | 100 (64.5) | 71 (64.0) | |

*P*-value was obtained using Chi-square test. $P<0.05$ was considered statistically significant

**Table 3:** The most influencing factors to purchase pharmaceutical products among customers

| Question | Total Frequency (%) | Gender | | | Education level | | |
|---|---|---|---|---|---|---|---|
| | | Male Frequency (%) | Female Frequency (%) | $\chi^2$ (*P*-value) | <Undergraduation Frequency (%) | ≥Undergraduation Frequency (%) | $\chi^2$ (*P*-value) |
| Which one of the following influences you the most to purchase any brand of your pharmaceutical product? | | | | | | | |
| Doctor's prescription only | 195 (71) | 105 (68) | 90 (81) | 10.278 (0.016) | 61 (65) | 134 (78) | 27.039 (0.000) |
| Price of the brand | 5 (2) | 5 (3) | 0 (0) | | 5 (5) | 0 (0) | |
| Company of the medicine | 35 (13) | 27 (17) | 8 (7) | | 8 (8) | 27 (16) | |
| Pharmacy shopkeeper's suggestion | 31 (14) | 18 (12) | 13 (12) | | 21 (22) | 10 (6) | |

Values are expressed as % response of the final respondents. Pearson's Chi-squared test was applied to assess the association of gender and education level of the participants in evaluating pharmaceutical products. $P<0.05$ is considered as statistically significant

respectively). Most of the participants prefer having double packaging and packaging (strips) marked with the days of the week, regardless of gender ($\chi^2 = 2.050$, $P = 0.359$, $\chi^2 = 2.331$, $P = 0.312$, respectively) and education level ($\chi^2 = 1.625$, $p = 0.444$; $\chi^2 = 0.486$, $P = 0.784$, respectively). Furthermore, the bottle's color and material also play a key role in the purchasing decision of the customers (57% opted for the water-colored bottle and 48% chose a plastic bottle) as well as the type of strip (56% opted for transparent strip). However, there was no significant difference between the groups based on gender and educational level.

Finally, we evaluated the effect of size and shape of the solid dosage form (tablet, capsule) on the buying pattern among customers [Table 7]. The majority of the group did not show any impact of size (45% of the participants) and shape (52% of the group) of the solid dosage form while buying. In addition to that, there were no gender differences in pharmaceutical product evaluation

**Table 4:** Buying characteristics of the customers

| Question | Total Frequency (%) | Gender | | | Education Level | | |
|---|---|---|---|---|---|---|---|
| | | Male Frequency (%) | Female Frequency (%) | $\chi^2$ (*P*-value) | <Undergraduation Frequency (%) | ≥Undergraduation Frequency (%) | $\chi^2$ (*P*-value) |
| Do you buy medicine showing the prescription? | | | | | | | |
| Yes | 131 (49%) | 75 (48) | 56 (50.5) | 0.110 (0.740) | 50 (53) | 81 (47) | 0.677 (0.411) |
| No | 135 (51) | 80 (52) | 55 (49.5) | | 45 (47) | 90 (53) | |
| Do you prefer buying pharmaceutical products of any specific pharmaceutical company? | | | | | | | |
| Yes | 85 (31) | 53 (34) | 32 (29) | 4.885 (0.087) | 23 (24) | 62 (36) | 4.076 (0.043) |
| No | 176 (66) | 97 (63) | 79 (71) | | 69 (73) | 109 (64) | |
| Not concerned | 5 (3) | 5 (3) | 0 (0) | | 3 (3) | 0 (0) | |

Values are expressed as % response of the final respondents. Pearson's Chi-squared test was applied to assess the association of gender and education level of the participants in evaluating pharmaceutical products. $P<0.05$ is considered as statistically significant

**Table 5:** Impact of esthetic properties of the liquid dosage form on pharmaceutical product evaluation

| Question | Total Frequency (%) | Gender | | | Education level | | |
|---|---|---|---|---|---|---|---|
| | | Male Frequency (%) | Female Frequency (%) | $\chi^2$ (*P*-value) | <Undergraduation Frequency (%) | ≥Undergraduation Frequency (%) | $\chi^2$ (*P*-value) |
| Do you prefer purchasing a liquid dosage form of the pharmaceutical product based on color? | | | | | | | |
| Yes | 28 (11) | 15 (10) | 13 (12) | 2.853 (0.240) | 17 (18) | 11 (6) | 8.562 (0.014) |
| No | 178 (67) | 110 (71) | 68 (61) | | 59 (62) | 119 (70) | |
| Not concerned | 60 (22) | 30 (19) | 30 (27) | | 19 (20) | 41 (24) | |
| Do you feel irritated in having a pharmaceutical product for its bitter-tasting nature? | | | | | | | |
| Yes | 130 (48) | 66 (43) | 64 (57) | 6.792 (0.034) | 56 (59) | 74 (43) | 7.245 (0.027) |
| No | 97 (37) | 61 (39) | 36 (32) | | 25 (26) | 72 (42) | |
| Not concerned | 39 (15) | 28 (18) | 11 (11) | | 14 (15) | 25 (15) | |
| Which taste of liquid dosage form do you like the most? | | | | | | | |
| Sweet | 117 (44) | 69 (45) | 48 (43) | 1.023 (0.906) | 39 (41) | 78 (45) | 11.346 (0.023) |
| Sour | 11 (4) | 5 (3) | 6 (5) | | 0 (0) | 9 (5) | |
| Sweet and Sour | 55 (21) | 31 (20) | 24 (22) | | 18 (19) | 37 (22) | |
| Not sure | 67 (25) | 40 (26) | 27 (25) | | 33 (35) | 34 (20) | |
| Others | 16 (6) | 10 (6) | 6 (5) | | 5 (5) | 13 (8) | |
| Which flavor of liquid dosage form do you like the most? | | | | | | | |
| Mango | 47 (18) | 28 (18) | 19 (17) | 7.402 (0.192) | 21 (22) | 26 (15) | 7.974 (0.158) |
| Banana | 7 (3) | 7 (5) | 0 (0) | | 0 (0) | 7 (4) | |
| Mixed Fruit | 76 (29) | 43 (28) | 33 (30) | | 27 (28) | 49 (29) | |
| Others | 0 (0) | 0 (0) | 0 (0) | | 0 (0) | 0 (0) | |
| Not sure | 136 (48) | 77 (49) | 59 (53) | | 47 (50) | 88 (52) | |

Values are expressed as % response of the final respondents. Pearson's Chi-squared test was applied to assess the association of gender and education level of the participants in evaluating pharmaceutical products. $P<0.05$ is considered as statistically significant

between males and females while considering the size ($\chi^2 = 1.854$, $P = 0.396$) and shape ($\chi^2 = 1.357$, $P = 0.716$) of the solid dosage form. Similarly, no significant differences were observed between the groups based on the education level in evaluating a pharmaceutical solid dosage form based on size ($\chi^2 = 4.519$, $P = 0.104$) and shape ($\chi^2 = 3.022$, $P = 0.388$).

**Table 6:** Impact of packaging on brand evaluation

| Question | Total Frequency (%) | Gender | | | Education Level | | |
|---|---|---|---|---|---|---|---|
| | | Male Frequency (%) | Female Frequency (%) | $\chi^2$ (*P*-value) | <Undergraduation Frequency (%) | ≥Undergraduation Frequency (%) | $\chi^2$ (*P*-value) |
| When you buy a pharmaceutical product, does the design of the packaging influence? | | | | | | | |
| Yes | 63 (11) | 34 (22) | 29 (26) | 2.575 (0.276) | 18 (19) | 45 (26) | 1.94 (0.379) |
| No | 145 (57) | 82 (53) | 63 (57) | | 54 (57) | 91 (54) | |
| Not concerned | 58 (22) | 39 (25) | 19 (17) | | 23 (24) | 35 (20) | |
| Do you prefer pharmaceutical products having double packaging (like- additional foil paper, pouch, etc.)? | | | | | | | |
| Yes | 137 (51) | 77 (49) | 60 (54) | 2.050 (0.359) | 44 (47) | 93 (54) | 1.625 (0.444) |
| No | 62 (24) | 34 (22) | 28 (25) | | 25 (26) | 37 (21) | |
| Not concerned | 67 (25) | 44 (29) | 23 (21) | | 26 (27) | 41 (25) | |
| Do you prefer to have the packaging (tablet strips) that are marked with the days of weeks? | | | | | | | |
| Yes | 171 (65) | 94 (61) | 77 (69) | 2.331 (0.312) | 60 (63) | 111 (65) | 0.486 (0.784) |
| No | 47 (15) | 33 (18) | 14 (13) | | 14 (15) | 28 (16) | |
| Not concerned | 48 (20) | 28 (21) | 20 (18) | | 21 (22) | 32 (19) | |
| Which type of bottle do you prefer for having liquid pharmaceutical products? | | | | | | | |
| Amber-colored bottle | 34 (8) | 21 (14) | 13 (12) | 0.260 (0.878) | 9 (10) | 25 (14) | 1.568 (0.457) |
| Water colored bottle | 156 (57) | 91 (57) | 65 (59) | | 59 (61) | 97 (57) | |
| Not concerned | 76 (35) | 43 (29) | 33 (29) | | 27 (29) | 49 (29) | |
| Which type of bottle material do you prefer most? | | | | | | | |
| Glass type | 94 (35) | 56 (36) | 38 (34) | 0.626 (0.890) | (33) | (36) | 2.121 (0.548) |
| Plastic type | 127 (48) | 75 (48) | 52 (47) | | (46) | (49) | |
| Not concerned | 45 (17) | 24 (16) | 21 (19) | | (21) | (15) | |
| Which type of strips do you prefer for a tablet/capsule? | | | | | | | |
| Opaque | 29 (11) | 20 (13) | 9 (8) | 1.792 (0.408) | 14 (15) | 15 (9) | 2.237 (0.327) |
| Transparent | 149 (56) | 83 (53) | 66 (60) | | 51 (54) | 98 (57) | |
| Not concerned | 88 (33) | 52 (34) | 36 (32) | | 30 (31) | 58 (34) | |

Values are expressed as % response of the final respondents. Pearson's Chi-squared test was applied to assess the association of gender and education level of the participants in evaluating pharmaceutical products. $P<0.05$ is considered as statistically significant

**Table 7:** Impact of size and shape of the solid dosage form on pharmaceutical product evaluation

| Question | Total Frequency (%) | Gender | | | Education Level | | |
|---|---|---|---|---|---|---|---|
| | | Male Frequency (%) | Female Frequency (%) | $\chi^2$ (*P*-value) | Below undergraduation *n* (%) | ≥Undergraduation Frequency (%) | $\chi^2$ (*P*-value) |
| Does the size of the pharmaceutical product influence your pharmaceutical product evaluation? | | | | | | | |
| Yes | 92 (35) | 49 (32) | 43 (39) | 1.854 (0.396) | 40 (42) | 52 (30) | 4.519 (0.104) |
| No | 110 (45) | 69 (45) | 41 (37) | | 32 (34) | 78 (46) | |
| Not concerned | 64 (20) | 37 (23) | 27 (24) | | 23 (24) | 41 (24) | |
| Does the shape of the pharmaceutical product influence in your pharmaceutical product evaluation? | | | | | | | |
| Yes | 63 (24) | 35 (23) | 28 (25) | 1.357 (0.716) | 26 (27) | 37 (22) | 3.022 (0.388) |
| No | 136 (52) | 78 (50) | 58 (52) | | 47 (50) | 90 (52) | |
| Not concerned | 67 (24) | 42 (27) | 25 (23) | | 22 (23) | 46 (26) | |

Values are expressed as % response of the final respondents. Pearson's Chi-squared test was applied to assess the association of gender and education level of the participants in evaluating pharmaceutical products. $P<0.05$ is considered as statistically significant

## DISCUSSION

Although health-related items are mostly function-driven, but health is an emotive and personal subject in and of itself. It is expected that doctors' advice would mostly drive the purchase of pharmaceutical products. However, our result reveals a deviation in this regard. People nowadays are not merely dependent on the physician's decision to buy medicine. Different health motivations, health ability, and product information are the precursor of the choice while purchasing any pharmaceutical product.[36,37] It is to be noted that although the majority of the sample (65%) in the undergraduate group opted for doctors' Prescription as the most impactful driver, the portion (22%) that chose shopkeepers' suggestions is also significant.

Lack of awareness regarding prescription is very prominent among the buyers in Bangladesh. 49% of buyers buy medicines without showing any prescription, which may lead to a further medication error. Moreover, shopkeepers of the pharmacy shop (mostly non-pharmacist in Bangladesh) hold a good influence on the purchase decisions of the people, and this domination is remarkably impactful on the buyers or consumers who are comparatively less educated. However, the habit of buying medicine from the shop without a prescription is found less among the undergraduate people. Buying medicine based on shopkeepers' decisions was found very less among them. They are probably aware of the different brands and the growth of brands of different generics. 36% of buyers who are undergraduates rely on some specific companies or brands to purchase their medications. They feel more satisfied by purchasing not only the product but also the image affiliated with that brand or company. This pattern of consumer behavior is similar to the observations of Nedungadi *et al*. and Parvin and Chowdhury.[32,38]

In terms of brand evaluation, the involvement of numerous factors has been revealed. The product appearance influences them very much. The taste, color, and flavor of medicine could be a prime influencer in brand evaluation. In medicine, color has a significant impact on human beings for maintaining the compliance of medicine.[39] The area of philosophy, psychology, and sociology has studied the concept of taste extensively. This study exposes further concentrations on the pharmaceutical products' flavor and taste, focusing on the significance of hedonic aspects, especially costly and lifestyle modification products. In general, the light pinkish color with a strawberry essence containing the sweet taste or light-yellow color with the lemon flavor with lemon or orange taste was found significantly appealing to the consumers during brand evaluation in different studies.[40] To the best of our knowledge, this is the first study in Bangladesh that got attention on the brand evaluation based on the taste of the pharmaceutical products. Female customers were more concerned about the taste, and among the educated group, this concern has additionally been increased. Female buyers were found more intolerant to the bitter taste of the medicine compared to male buyers. Moreover, pregnant women undergo morning sickness and feel nausea vomiting, so the medicine's bitter taste irritates them to a greater extent. So masking the bitterness of the drugs ought to get more attention on female hormonal pharmaceuticals and drugs administered orally during the pregnancy period. In addition, as the taste buds of the individuals aged under 20 years are most sensitive, they are mostly found less enthusiastic about being compliant to the medicine having a bitter taste.[41] The taste and flavor of the pharmaceuticals are generally critical for pediatric as well as geriatric medications. A vast number of buyers proposed mixed-fruit flavor for the liquid preparations as well as also incline toward mango flavor of the liquid dosage forms. In contrast, a large number of participants were found who were not concerned about the taste and flavor of the liquid dosage form of the pharmaceutical products. This phenomenon is more common in the parents having an education level of less than undergraduation.

Different interventional tools have been making a high effect among people of different ages and classes to reduce non-adherence to medicine.[42] Product packaging is one of them. It has been well established that product design and product packaging have been used as essential tools to create competitive advantages.[43-45] The packaging of products carries a high impact on

people for adherence to medicine. Similarly, in most cases, the container's material is found to be a most concerning fact for people nowadays. As non-compliance is multifactorial, it may also arise from the bottle's material and appearance.[46,47] More than 47% of the people (both male and female) considered plastic-type containers more advantageous over glass-type bottles.

Furthermore, the medicine's visibility might provide some sort of psychological advantages because the majority of buyers preferred transparent packaging for both solid and liquid dosage forms as the study demonstrated that customers desired products in transparent packaging compared to the products in non-transparent packaging.[48] The bottle, which is water colored or transparent, is accepted by a higher number of buyers as the medicine can easily be seen. More than 50% of the people are satisfied with it. However, a similar phenomenon has also been found with the strips of solid dosage forms like the liquid dosage forms. There are different orally disposable strips of medicine made of PVC to get dissolved in the mouth cavity, affecting human beings.[49] The transparent strips are accepted in a wide range of opaque ones, as the medicine can be appropriately seen outside. Customers probably feel safer buying medicine by seeing them.

Older adults are more likely to suffer from chronic morbidity from multiple diseases—20–30% of older people take at least three or more medications every day. Moreover, several conditions may require concurrent drug treatment. Polypharmacy is also known to have a strong association with poor compliance.[46] In this case, packaging with weekdays marking has brought a solution for better patient compliance and works as a reminder for regular medication intake. More than 65% of the people, both male, and female prefer to have weekdays in strips. Similarly, about 65% of the undergraduates choose to have weekdays in the strips. Especially for elderly patients who cannot remember their medication intake timely, this design of strip is more helpful. Similarly, the double packaging of the product got an immense interest in the customer. Probably comparatively higher humidity of the environment of Bangladesh is the reason behind this preference.[50]

## CONCLUSION

The study results revealed that shopkeepers play as a significant partner amid the buying choice of pharmaceutical items. Hence, appropriate and standard instructive programs may be included within the promotional activities of the pharmaceutical companies. Furthermore, product presentation and packaging material are yet crucial variables for affecting the buying decisions. As double packaging is encouraged by most customers, it could get contemplations, especially for hygroscopic drugs. However, the study did not differentiate between the buying behavior of prescription drugs and OTC drugs, which is a limitation of this study. Hence, the observed result encourages further in-depth research to understand the specific buying behavior of prescription drugs and OTC drugs.

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## AUTHORS' CONTRIBUTION

NMMAB, PR and SI developed the concept and questionnaire of the study. PR, SI, and NAH conducted this study. PR, SI, and MH did the literature review. Data analysis was done by NMMAB, SI, PR, and MH. NMMAB, PR, SI, and NAH wrote the manuscript. NMMAB and MH edited and finalized the manuscript. NMMAB acted as the corresponding author. All the authors approved the final manuscript.

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