**Pharmaceutical advertisement and Citation practice in the leading Therapeutic Indexes in Bangladesh**

**Abstract**

Pharmaceutical companies often promote their product-related information in the Therapeutic Index since physicians would like to get ready information about pharmaceuticals from these books. This study aimed to analyze advertisements and citation practice of those advertisements in the therapeutic index. Two therapeutic indexes; QIMP (Quick Index of Medical Product and Problems) and MIMS (MediMedia Index of Medical Specialties) were collected in 2013. QIMP is published from Bangladesh while MIMS from Singapore. There were 444 advertisements found in QIMP (342) and MIMS (102). Around 96.85% advertisement did not mention any references. Nearly 1.6% of the references included journal articles, followed by “web site” 0.9%, “book” 0.5%. Prescribing information and company’s website were found in 1.4% and 50% advertisements respectively. Prior approval was received from the drug administration in 2.3% cases.

Information in the advertisement frequently does not have scientific evidences to support their statement. We suggest that physicians should cross-check the information provided in the advertised pages in these therapeutic indexes.

Keywords: Advertisement; Journal; Book; QIMP; MIMS.

**Key Messages**

* Pharmaceutical companies often promote their brands in the Therapeutic Index.
* This study explores the citation practice and advertisement characteristics.
* Information content in the product advertisement often does not have scientific facts to support their statement.
* This study suggests that physicians should cross-check the information provided in the advertised pages.

**Introduction**

Pharmaceutical industry in Bangladesh contributes a considerable portion in country’s economy. There are 250 companies manufacturing allopathic drug with more than 8,000 brands operating their activities within the country to meets internal as well as external demand. This large number of drug is composed of 117 essential drugs and 100 supplementary drugs. The pharmaceutical market size in Bangladesh is over 100 billion BDT (USD $ 1.28 billion) with a growth of 12% annually of which a large percentage comes from sales of Over the Counter (OTC) medications ([1](#_ENREF_1), [2](#_ENREF_2)). Here, pharmaceutical companies are allowed to promote Under the counter (UTC) brands in specific media such as medical journals, therapeutic indexes but not in the mass media. OTC drugs needs to take prior approval from the authority (Directorate of drug administration, Bangladesh) to promote in the mass media. Nevertheless, advertisement of product creates awareness to the target customers, example; OTC advertisement to the mass people and UTC to the physicians. So, advertisement is an important strategy to increase the sales volume of the drug. Besides product-related information, pharmaceutical company also promote portfolios to the physicians and end level customers ([3](#_ENREF_3)). Therapeutic index and medical journal are two important media where pharmaceutical companies focus their major part of attention.

At present, two therapeutic indexes are available in Bangladesh. These books devote considerable space to advertise pharmaceuticals. The information and contents given in the advertisement reminds prescribers to that particular advertised product. Therefore, it yields millions of dollars of additional sales and profits to the advertisers. The advertisement is therefore an important concern for healthcare provider and healthcare controlling authority in worldwide. The content of the advertisement are mostly the summary of recent research findings from the clinical trials related to that particular drugs. People collect the information from the published journal or web page or book to develop the contents for advertisement. Thus, these advertisement should cite external source to support their claims ([4](#_ENREF_4)). Unfortunately, previous study demonstrated that wrong information and insufficient evidences was used to promote pharmaceutical products ([4-6](#_ENREF_4)). Previous study also showed that 50% information provided in the promotional materials of pharmaceutical product are debatable and 12% were forged ([7](#_ENREF_7)).

Our present study includes two mostly used and mostly accessed therapeutic indexes in Bangladesh. They are MIMS (MediMedia Index of Medical Specialties) and QIMP (Quick Index of Medical Product and Problems).

**Objectives**

The aim of our present study is to analyze the source of information, type of references, major therapeutic classes and type of drugs promoted by the pharmaceutical companies in these therapeutic indexes. This study is going to quantify the number and nature of pharmaceutical advertising in these indexes and compare those factors.

**Materials and Methods**

The study sample consisted of one issue of 2 therapeutic indexes (QIMP and MIMS) published in 2012. In each, the total number of pages (including the covers) and the number of pharmaceutical advertising pages (total and inserts) were counted manually. All products related advertisement was collected by the investigator. Neutral person with pharmD degree has cross checked all data thoroughly. Neutral person was unaware about the purpose of this study. The ethical approval was not required for this project. We followed the Anatomical Therapeutic Chemical classification (ATC) for determining major therapeutic classes ([8](#_ENREF_8)). Antidiabetic drug was consists of insulin and analogues, blood glucose lowering oral drugs excluding insulin and aldose reductase inhibitors. Musculoskeletal drugs was consists of anti-inflammatory and anti-rheumatic products, topical products for joint and muscular pain, muscle relaxants, anti-gout preparations, drugs for treatment of bone diseases, other drugs for disorders of the musculoskeletal system. Hormonal drugs were systemic hormonal preparations excluding sex hormones and insulins, pituitary and hypothalamic hormones and analogues, corticosteroids for systemic use, thyroid therapy, pancreatic hormones, calcium homeostasis. Ophthalmic drugs were defined as the drugs that used as anti-infectives, anti-inflammatory agents, anti-inflammatory agents and anti-infectives in combination, anti-glaucoma preparations and miotics, mydriatics and cycloplegics, decongestants and anti-allergics, local anesthetics, ocular vascular disorder agents for ophthalmic purpose. Anti-infectives were defined as anti-bacterials for systemic use, anti-mycotics for systemic use, anti-mycobacterials, antivirals for systemic use, immune sera and immunoglobulins, vaccines. Cardiovascular drugs were defined as anti-hypertensives, diuretics, peripheral vasodilators, vasoprotectives, beta blocking agents, calcium channel blockers, agents acting on the renin-angiotensin system, lipid modifying agents. Alimentary drugs were defined as stomatological preparations, drugs for acid related disorders, drugs for functional gastrointestinal disorders, anti-emetics and anti-nauseants, bile and liver therapy, drugs for constipation, anti-diarrheals, intestinal anti-inflammatory/antiinfective agents, digestives includings enzymes. Nervous system drugs were classified as anesthetics, analgesics, anti-epileptics, anti-parkinson drugs, psycholeptics, psychoanaleptics. Vitamin-Minerals were defined as multivitamins, combinations, multivitamins plain, calcium, potassium. Respiratory drugs were nasal preparations, throat preparations, drugs for obstructive airway diseases, cough and cold preparations, antihistamines for systemic use. Urological products were comprises of acidifiers, urinary concernment solvents, drugs for urinary frequency and incontinence, drugs used in erectile dysfunction and drugs used in benign prostatic hypertrophy. Dermatological drugs were defined as anti-fungals for dermatological use, antibiotics and chemotherapeutics for dermatological use, corticosteroids, and dermatological preparations.

Advertisements containing at least one medical or pharmaceutical claim were considered for evaluation. In this study, we did not include advertisement containing pages where no drug related information provided. Advertisements on herbal, ayurvedic medicines were excluded as well. Source of information were classified into journal, book, web and data on file. Approval of Drug administration and prescribing information were also counted.

**QIMP:** This therapeutic index is published from inside of Bangladesh and edited by Ridwan Ullah Shahidi. First edition of this index was published in 1985 while the last edition (16th) was published in May, 2012. This index has 4 sections; section 1, 2, 3 and 4 contains therapeutic page index, indigenous medicine, research and development in medicine and pharmaceutics and appendices and indices respectively. The index contains 608 pages, 22 therapeutic class, 8890 brand names and pharmaceutical company information ([9](#_ENREF_9)).

**MIMS:** This therapeutic index is published from Singapore. MIMS (Issue 2, 27th edition) was published in 2012. This index contains 452 pages (excluding cover, back pages) information regarding, Therapeutic Classification of drugs, pregnancy safety index, pre- and post-prandial advice, drug profiles, medical research advances, disease management, common medical advice, new products, new brands, new presentations, general index of products, manufacturers index, generic and brand index. There were 22 therapeutic class, 526 generics, 6318 brand names ([10](#_ENREF_10)).

**Statistical analysis**

Descriptive statistical analyses were performed using SPSS for Windows version 16. Frequencies and percentages were used to express categorical variables. Statistical tests were conducted at a significance level lower than 0.05. Differences in the distribution of categorical variables were compared using the χ2 test.

**Results**

There were 444 advertisements found in QIMP (342) and MIMS (102). The highest percentage of advertisement size in QIMP was quarter 37.2% (127) followed by full 23.4% (80), half 23.4% (80), and one third 16.1% (55) (table 1). The highest percentage of advertisement size in MIMS was one third 39.2% (40) followed by half 28.4% (29), full 24.5% (25), and quarter 7.8% (8). In total, quarter size product advertisement was found in highest percentage (30.4%) followed by half (24.5%), full (23.5%), and one third (21.4%).

Higher percentages of pages were allocated for advertisement in QIMP (170, 27.93%) than MIMS (55, 12.12%). Only 14 (2.25%) advertisements cited at least one reference while 97.75% (430) advertisements were not cited a single reference. QIMP cited 10 (3.01%) references while MIMS cited 4 (4.08%) references for their contents.

Reference in the pharmaceutical advertisement were found as four sources which includes data on file (information is available upon request from the company’s office), journal articles (research findings published in journal), book (information quoted from book), and web site (information collected from authentic web site). There were 3.15% advertisements includes at least 1 out of four references. At least 1 reference was cited in 2.92% (10) and 3.92% (4) advertisements in QIMP and MIMS respectively. A concise summary of the extracted advertisements is given in table 2. Among four types of references only 1.6% (7) advertisements were cited from journal articles followed by book 0.9% (4).

Prescribing information was found in 1.4% (6) advertisement. Prior approval from the drug administration was taken in 2.3% (10) cases. Company’s website was found in 50.9% (226) cases. Therapeutic class wise analysis showed that 112 (25.2%) advertisement promoted anti-infective (e.g.; antibiotics), 60 (13.5%) alimentary (e.g.; proton pump inhibitors), 54 (12.2%) vitamin-minerals, 50 (11.3%) cardiovascular drugs (table 3).

**Discussion**

The result of the present study showed that (i) QIMP and MIMS both allocate substantial amount of space for pharmaceuticals, (ii) a large number of advertisements did not provide any scientific evidence to support their promotional statement, (iii) anti-infective and anti-inflammatory generics were mostly advertised, (iv) a negligible (2.3%) number of companies are getting permission before publishing the advertisement.

QIMP provides comparatively higher percentage of area since this book is published from inside of the country and has more access to local pharmaceutical companies to collect advertisement. Here we report that QIMP is excessively advertising pharmaceuticals. Excessive advertisement will ultimately distract readers from the core product-related information. Moreover, multiple numbers of advertisements on the cover page, back page, insert and use of unnecessary heavyweight paper make the journal exasperatingly open and carry the book. They are particularly disturbing since advertise containing pages force the readers to turn several pages before getting required information. Finally, 27% extra pages with high quality and colorful advertisements in heavyweight pages causes the book (therapeutic index) more costly to the physician.

The most important findings of this study were that a large number of advertisements which did not provide any scientific evidence to support their promotional statement. These findings were similar for both QIMP and MIMS. Previous study in Bangladesh reported that 82% pharmaceutical product related advertisement did not mention any reference in MIMS([11](#_ENREF_11)) while this rate is low in other countries such as 62.1% in India ([12](#_ENREF_12), [13](#_ENREF_13)), 44% in Spain ([14](#_ENREF_14)), 21% in Switzerland ([15](#_ENREF_15)) and 94% in Germany ([16](#_ENREF_16)). Moreover, 48.2% advertisement were failed to comply FDA guideline in USA ([17](#_ENREF_17)). In Russia, 98% advertisement does not provide any references. In Bangladesh, the percentage of citation practice in MIMS is decreased from 18% ([11](#_ENREF_11)) to 4% (based on the findings of the present study). We expect that MIMS will have higher number of scientific evidences to support the claims than their competitor index QIMP since MIMS published from the Singapore and well regulated by the world wide editor panels. Interestingly, there were no differences observed between QIMP and MIMS in respect of number of scientific evidences included in the advertisement. Without valid evidence it is difficult for the physicians to prescribe drug on the basis of claimed drug information. Therefore, the responsibility goes to the physicians shoulder to cross check drug related information published in QIMP and MIMS. Physicians should justify drug information before prescribing to the patient.

Therapeutic class wise analysis revealed that anti-infective and anti-inflammatory generics were mostly advertised than others in the therapeutic index. This is expected since most of the OTC generics e.g.; amoxicillin, penicillin, omeprazole, ranitidine belongs to this therapeutic classes. Since OTC generics play a vital role in sales that’s why pharmaceutical company promotes these brands vigorously.

The discovery of new information related to the pharmaceutical product especially those will bring positive image of the drugs got the highest priority to be included in the advertisement. New research findings are immediately available and accessible from any part of the world with the help of web sites and citation manager such as endnote. It is generally believed that citation of journal articles is more attractive to the authors than the book citation. We also observed in our study that the number of journal citation is higher than the book citation and even others. Lal A et al., in 1996 reported that 76%, 15% and 2% references were collected from journal articles, books and “data on file” respectively ([12](#_ENREF_12)).

In Bangladesh, pharmaceutical companies are asked to get prior approval from the drug administration before promoting their product related information. According to our present report a negligible (2.3%) number of companies are getting this permission before publishing the advertisement in QIMP and MIMS. Hence, government should take initiative to monitor this advertisement before the publication of these books. We found that half of the advertisement includes the address of own website. We search internet and found that the information content in those websites is backdated. Prescribing information is only mentioned in the respective web pages. Even some of the companies do not have individual product related information. However, pharmaceutical companies should update their product related information in the web sites which could be a great advantage of this company. Moreover, drug related information should be supported by the authentic online journal source.

Limitations

Our present study is cross-sectional and not aimed to investigate the effect of any substance. The study samples include only the samples from two books and do not represent the entire population because of the non-random sample selection method used.

**Conclusions**

In this study, two therapeutic indexes were selected to analyze the advertisement of drugs and their referencing practice. We found that drug information provided in the QIMP and MIMS were taken considerable space, but most of the advertisement product related information was not based on scientific references. Healthcare providers should be cautious and not convinced by the lucrative pharmaceutical advertisements rather they should cross check the claims before prescribing to the patient. Finally, present situation can be improved if regulatory body and paharmaceutical industry come together and monitor, strictly control citation practice to support product related information in their advertisement.

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**Competing interests**

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Table 1. Size of pharmaceutical product related advertisement in the therapeutic index.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Page allocated | QIMP (342) | | MIMS (102) | | Total (444) |
| Size (mm) | Frequency | Size (mm) | Frequency |  |
| Full | 185x245 | 80 (23.4%) | 140x210 | 25 (24.5%) | 105 (23.5%) |
| Half | 185x122 | 80 (23.4%) | 140x105 | 29 (28.4%) | 109 (24.5%) |
| One Third | 185x81 | 55 (16.1%) | 140x70 | 40 (39.2%) | 95 (21.4%) |
| Quarter | 185x60 | 127 (37.1%) | 60x100 | 8 (7.8%) | 135 (30.4%) |

Table 2. Types of reference used, approval from drug regulatory body and availability of prescribing information in the therapeutic index.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | QIMP (N=342) | | MIMS (N=102) | | Total (444) | |
|  | Present (%) | Absent (%) | Present (%) | Absent (%) | Present (%) | Absent (%) |
| Data on File | 1 (0.3) | 341 (99.7) | 0 (0) | 102 (100) | 1 (0.2) | 443 (99.8) |
| Journal articles | 5 (1.5) | 337 (98.5) | 2 (2) | 100 (98) | 7 (1.6) | 437 (98.4) |
| Book | 2 (0.6) | 340 (99.4) | 0 (0) | 102 (100) | 2 (0.5) | 442 (99.5) |
| Website | 2 (0.6) | 340 (99.4) | 2 (2) | 100 (98) | 4 (0.9) | 440 (99.1) |
|  |  |  |  |  |  |  |
| Prescribing Information | 4 (1.2) | 338 (98.8) | 2 (2) | 100 (98) | 6 (1.4) | 438 (98.6) |
| Approved by Drug Administration | 7 (2.0) | 335 (98.0) | 3 (2.9) | 99 (97.1) | 10 (2.3) | 434 (97.7) |
| Self Website | 190 (55.6) | 152 (44.4) | 36 (35.3) | 66 (64.7) | 226 (50.9) | 218 (49.1) |

Table 3. Major therapeutic classes promoted in the therapeutic index.

|  |  |  |  |
| --- | --- | --- | --- |
|  | QIMP (342) | MIMS (102) | Total (444) |
| Anti-diabetic | 18 (5.3%) | 8 (7.8%) | 26 (5.9%) |
| Musculoskeletal | 28 (8.2%) | 7 (6.9%) | 35 (7.9%) |
| Hormonal | 14 (4.1%) | 4 (3.9%) | 18 (4.1%) |
| Ophthalmic | 2 (0.6%) | 0 (0.0%) | 2 (0.5%) |
| Anti-infective | 85 (24.9%) | 27 (26.5%) | 112 (25.2%) |
| Cardiovascular | 44 (12.9%) | 6 (5.9%) | 50 (11.3%) |
| Alimentary | 42 (12.3%) | 18 (17.6%) | 60 (13.5%) |
| Nervous system | 24 (7.0%) | 6 (5.9%) | 30 (6.8%) |
| Vitamin-Mineral | 46 (13.5%) | 8 (7.8%) | 54 (12.2%) |
| Respiratory | 29 (8.5%) | 8 (7.8%) | 37 (8.3%) |
| Urological | 2 (0.6%) | 9 (8.8%) | 11 (2.5%) |
| Dermatological | 7 (2.0%) | 1 (1.0%) | 8 (1.8%) |