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Current trends of orthodontic research in Pakistan

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Abstract

Introduction: Orthodontic research in Pakistan has evolved rapidly in the past decade. The aim of this paper is to give an overview of the trends of the research in past 5 years with reference to study type, designs and subject of research.

Material and Methods: Citations of orthodontic articles from 2008-2012 from Pakistan were identified by electronic as well as manual search in major local as well as international databases and journals. All citations were then organized and analyzed in Microsoft Excel 2010 software. The studies were classified on the basis of their designs and topic of interest.

Results: A total of 137 studies were included after screening. Cross-sectional descriptive studies dominated the study designs (43%), while experimental studies were only 12 (8.7%). Cephalograms (33%) and dental casts (22%) were the most common topics of interest, comprising more than half of all the studies, while adhesives based studies were lowest in number (3%).

Conclusions: Cross sectional descriptive studies on cephalometry and dental casts were the most common trends seen in this review, but many deficiencies were also identified. Orthodontic training programs in Pakistan must incorporate more research oriented workshops, continuing education on medical writing and biostatistics and awareness programs for improvement in the quality of orthodontic research.

Keywords: Medical writing; workshops; biostatistics

Introduction

Orthodontic research in Pakistan has evolved gradually over the past few years. The major contributions to this research are due to the collaborative efforts of Pakistan Medical &Dental Council (PMDC), College of Physicians and Surgeons, Pakistan (CPSP), Higher Education Commission (HEC), Pakistan Association of Orthodontists (PAO) and others. With increasing number of fellows in Orthodontics at CPSP, the research has also improved both qualitatively and quantitatively. Orthodontic research in Pakistan has also made its way into the international journals and several indexed publications can now be seen in international medical databases.[1,2]

Global orthodontic research trends have profoundly changed in the past decade.[3] Advent of new treatment modalities such as Temporary anchorage devices (TAD's), advances in cellular and molecular research and renewed imaging modalities have given orthodontic research another dimension to explore.[4] But one main noticeable trend is the shift from diagnostic records to patients and then to orthodontists' perception, which indicates the change in core orthodontic diagnostic and treatment concepts. Absolute anchorage with skeletal plates and soft tissue paradigm are some of the examples of this focus shift.

With increasing emphasis on evidence based practice, the research designs and methods are also becoming more and more stringent and prospective experimental trials are now becoming the standard of quality research. Systematic reviews and meta-analyses aim to assess the available level of evidence by assessing the quality of trials and other available evidence systematically.[5]

How is the orthodontic research in Pakistan keeping up with these dynamic global trends? A deeper look into the Pakistani orthodontic research can identify the current trends and

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future directions of this research. Also common mistakes and errors can be identified to help improve the orthodontic research standard. This paper aims to give an overview of the trends of the research in past 5 years with reference to study type, designs, subject of research in order to investigate the positive attributes and problems as well as to suggest improvements for the future.

Material and Methods

Citations of articles from Pakistan were identified by electronic as well as manual search (Figure 1). Search date was carried out on 3rd November 2012. PUBMED and PAKMEDINET databases were searched electronically. Search string in PUBMED was "orthodontic* Pakistan", while in PAKMEDINET, "orthodontic*" was used. The websites of Pakistan Oral and Dental Journal (PODJ), Journal of Pakistan Dental Association (JPDA) and Pakistan Orthodontic journal (POJ) were accessed separately and orthodontic publications were screened manually. Search was restricted to past 5 years only. Articles in any Pakistani journal with foreign authors were excluded.

All the PUBMED and PAKMEDINET citations were then imported into ENDNOTE citation manager software (Figure 2) and were further screened for inclusion in the study. Manually searched data along with the electronic citations were then organized and analyzed in Microsoft Excel 2010 software (Figure 3). The studies were classified on the basis of their designs and topic of interest.

Results

A total of 137 studies were included after screening. Distribution of these studies according to their designs is given in Figure 4. Further breakdown of cross-sectional studies is given in Figure 5. Cross-sectional descriptive studies dominated the study designs (43%), while experimental studies were only 12 (8.7%).

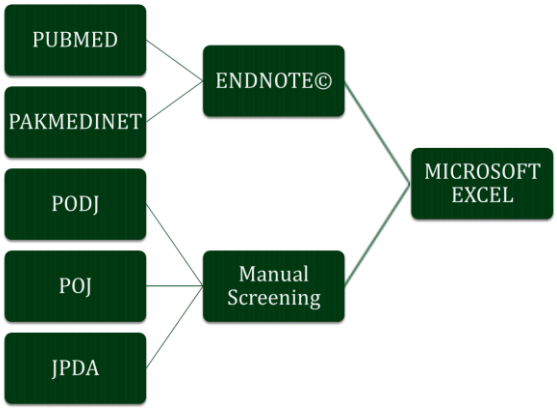

Figure 1: Flowchart of the study

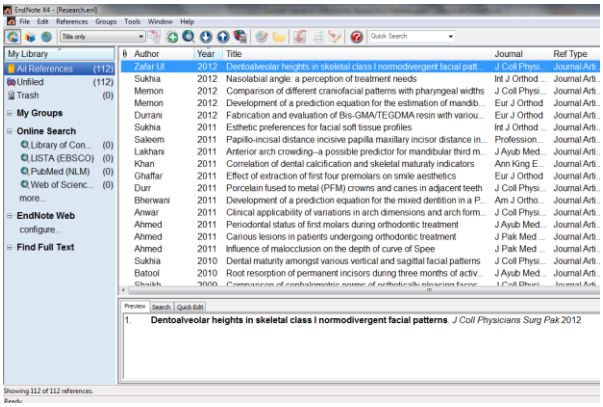

Figure 2: Collections of Citations in Endnote™

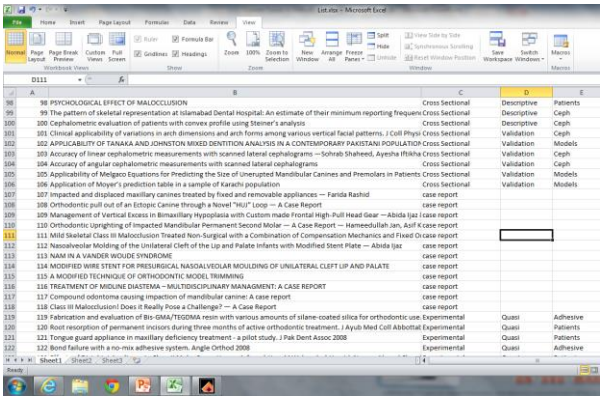

Figure 3: Data analysis in Microsoft Excel™

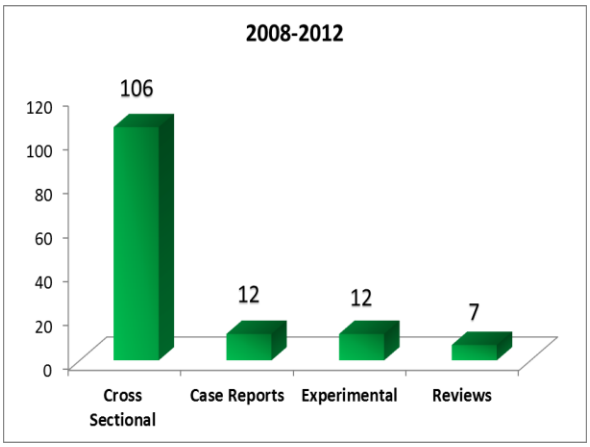

Figure 4: Study designs frequency

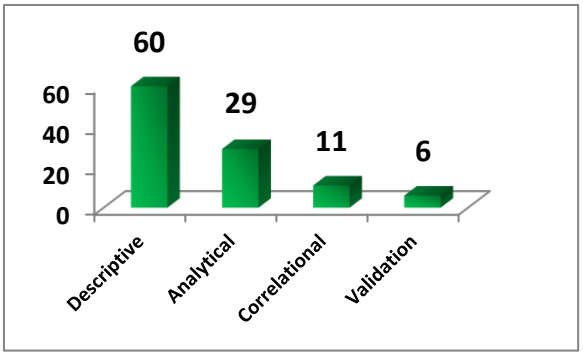

Figure 5: Subdivision of Cross-sectional studies

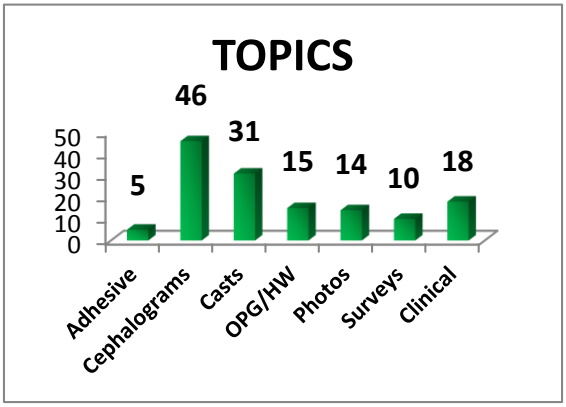

Figure 6: Topics distribution

Distribution of studies according to the topic of interest is given in Figure 6. Cephalograms (33%) and dental casts (22%) were the most common topics of interest, comprising more than half of all the studies, while adhesives based studies were lowest in number (3%).

Discussion

This study reviewed the current trends of orthodontic research in Pakistan as it relates to the study designs and topics of interest. Cross sectional descriptive studies on cephalometry and dental casts were the most common trends seen in this review.

While cross sectional descriptive studies generate raw data to further work on, they are nevertheless inconclusive regarding associations or causal relationships. The probable reason why clinicians prefer these studies is due to its ease of carrying out with little cost, effort and time required.

Analytical studies, relatively stronger class of the observational studies, were seen in modest number in the literature (21%), indicating an urge to shift from pure descriptive studies. Correlations and Validation studies were also seen but only scarcely (12%). Similarly more robust designs needing more resources, effort and time such as experimental research and systematic reviews were very few. Several reasons can be responsible for this e.g. lack of awareness and continuing education in research methods, and limited access to quality biostatisticians to help refine the statistics involved. Nevertheless, this is an encouraging trend and more comparison and experimental studies can be expected in the future with increased awareness about research among the young orthodontists.

As for the topics of interest, as pre-treatment casts and cephalograms are readily available in most orthodontic departments, they are still extensively researched in Pakistan. A disturbing aspect of this trend is that more and more duplicate studies or almost similar studies keep appearing in the local journals. Case reports and studies in clinical settings are also popular but materials based studies are almost non-existent. Although research on casts and cephalograms should not be discouraged, more innovative and genuine research questions should be formulated to carry out quality research in these areas.

A superficial look at the research papers in past five years revealed some encouraging aspects such as increasing international publications, excellent writing and more stringent study designs. The number of these studies was very low however. In general orthodontic research in Pakistan is plagued with less than adequate study designs, lack of ethical approval and informed consent from patients, plagiarism, 'fabricated' data, poor statistical handling and errors in medical writing as common deficiencies. Gift authorship, incorrect conclusions, poor results description, vaguely defined objectives and irrelevant content are also prevalent. It is also apparent that many studies are conducted for the sake of publishing and promotion, and lacked any genuine research questions and therefore failed to draw any solid conclusions and clinical recommendations. Several factors are responsible for these deficiencies including the scarce research education both at undergraduate and postgraduate level, limited resources and facilities, perceived monetary benefits associated and a general lack of appreciation and encouragement on part of public as well as private educational institutions.

The major core of dental and orthodontic research in Pakistan is promotion or examination driven, and therefore once this purpose is achieved, the research mostly becomes a low priority task. Although this "promotion" impetus has kept the research going in some form, it is difficult to expect quality improvement. Orthodontic training programs must incorporate more research oriented workshops, continuing education on medical writing and biostatistics and awareness programs about publications and its impact in orthodontics.

Conclusions

Cross sectional descriptive studies on cephalometry and dental casts were the most common trends seen in this review, but many deficiencies were also identified. Orthodontic training programs in Pakistan must incorporate more research oriented workshops, continuing education on medical writing and biostatistics and awareness programs for improvement in the quality of orthodontic research.

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