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Assessment of commercially available manual toothbrushes in India: A cross-sectional survey

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Abstract

Introduction: A variety of manual toothbrushes are available all over the world. A quick go through of the list of commercially available manual toothbrushes in India will be informative for the people all over the world.

Aim: To present the information about the manual toothbrushes commercially available in the Indian market.

Materials and methods: The present study was conducted by collecting various brands of manual toothbrushes available in the Indian market was collected. The toothbrushes for adults as well as for kids were included in

the study. The salient features, types and maximum retail price (MRP) for each toothbrush were tabulated.

Result: Total, 107 toothbrushes were collected from 43 various towns and cities of India.

Conclusion: This study will be helpful to provide an insight for people in India & all around the world to get information regarding manual toothbrushes commercially available in India. Easy and quick information in a single chart is available.

Keywords: Dental Hygiene, Oral Health, Toothbrush

Introduction

Cleaning the teeth has been advocated since ancient times & has been an integral part of oral hygiene routine across many cultures around the world. Oral hygiene practices involve the thorough daily removal of dental plaque and debris by a tooth brush without injuring the soft tissue ^[1, 2]. The most common and modern mechanical method of tooth cleaning is the use of a toothbrush in combination with a dentifrice ^[3]. Various chemical and mechanical methods are available commercially for the removal of plaque. Tooth brushing is found to be the most commonly used effective and safest method for plaque removal ^[4]. Manual tooth brush remains the primary method of maintaining good oral hygiene in majority of the population ^[5]. Before the invention of toothbrushes, various aids like neem, babool tree twigs; were used. Chewing these twigs helped in creating frayed ends which in turn helps to clean teeth and gums along with freshening of the breath. These twigs contain tannins and antibacterial oils which further help in removing accumulated plaque and its further build-up ^[6]. In the year 1600, China first invented the bristled toothbrush. H. N. Wadsworth first patented it in America in 1857 ^[7]. The first modern toothbrush was manufactured in England by William Addis in 1780 ^[8, 9].

Manual toothbrushes vary in size, shape, texture, and design more than any other category of dental products ^[10]. They have been standardized in dimensions by the American Dental Association. Manual toothbrush is designed in the form of head, shank and handle. The head is further divided into toe, which is its farthest end from the handle and the heel which is the closer end from the handle. The head contains various tufts of bristles with various dimensions that are usually made up of nylon because it is considered superior to the previously available natural bristles made up of hog. This is because nylon bristles have ten times more flexibility and are more resistant to abrasion, breaking or splitting and have better cleaning abilities ^[11]. The bristles are perhaps the most important consideration in selecting a good toothbrush. There are different varieties of bristle designs available which include flat trim, rounded, tapered, multilevel, zigzag, wavy, rounded, etc ^[12]. Bass in 1948, reported that the bristles which were bluntly cut and had sharp end configurations could cause damage to the soft tissues

whereas the rounded, smooth, tapered bristles are less abrasive [13]. It was also observed that the tapered bristles had better efficiency in plaque removal than the end-rounded bristles [14]. Few studies show no evidence of the superiority of one design of bristles over the other [15, 16]. Toothbrushes in India are also available in different textures as per their diameter of the bristles which are further classified into hard (0.4mm), medium (0.3mm), soft (0.2mm) and extra soft (0.1mm) [11]. Besides cleaning of teeth, the injudicious use of toothbrush has been associated with harmful effects on dentition. Some studies have found that hard toothbrushes cause more abrasion than soft brushes [17, 18]. A study demonstrated that when the soft toothbrushes with end-rounded bristles are used with toothpaste they resulted in better plaque removal & lesser incidence of gingival abrasion as compared to the toothbrushes with tapered bristles [17]. Toothbrush handles are available in various shapes and designs. They are designed with indentations for better grasp and various angulations that permit a better access into various hard to reach areas of the mouth. Toothpaste is applied on the bristles for effective cleaning. Although there are various ways of removing plaque, including mechanical and chemical, the use of the manual toothbrush is supposed to be the most effective and most used method, but its efficacy is relative to several parameters such as the type of toothbrush & toothpaste, method of brushing, appropriate time to brush, as well as its use with an adjuvant such as dental floss or mouthwash [12]. According to World Health Organization, 80% of the world populations suffering from oral diseases live in developing countries, indicating that oral diseases are strongly correlated with low income [17]. As quoted by Salunkhe S *et al.* approximately 72% of people in India reside in villages and small towns and are of lower socioeconomic status [18]. Various types of toothbrushes available in the Indian market keep the buyer in a state of dilemma as to which one to choose, due to lack of information about the quality of it. However, besides having potential benefits of dental plaque

biofilm removal and improving oral health, the injudicious use of toothbrush in causing injuries to dental hard and soft tissues has also been documented; abrasion being most common amongst them [19, 20].

Thus, this study was undertaken to find out more information about the different brands and types (super soft, soft, medium & hard bristles) of manual toothbrushes available in the Indian market enlisting their characteristics. This study will be helpful to provide an insight for people in India & all around the world to get information regarding manual toothbrushes commercially available in India. Easy and quick information in a single chart will be available.

Materials and method

This study was conducted at a Dental Institute. A total of 107 manual toothbrush samples of various types and brands were collected from 43 places in India across 14 states which included villages, towns and cities. The samples were collected from a variety of places where they were sold which included but were not confined to super markets, super shoppers, local kirana (grocery) stores, medical stores, army CSD canteens, local pan shops etc.

Results

Salient features and the respective maximum retail prices (MRP) were collected from the websites & carton (packaging) of the toothbrushes and they are presented in a tabulated form in Table 1 and Table 2. Among the toothbrushes collected, majority of the toothbrushes belonged to Colgate brand (16 adult toothbrushes and 4 kids' toothbrushes), followed by Oral-B (15 adult toothbrushes). Among adult toothbrushes, Oral-B Pro health smart flex toothbrush costs around 125 Rupees (most expensive) whereas cheapest toothbrush is available for Rs.10 (Patanjali Soft toothbrush). Among kids' toothbrushes, Chicco kids' toothbrush was most expensive (MRP 179 Rupees) whereas cheapest toothbrush costs around Rs.10 (Denta check kid toothbrush).

Table 1: Information related to Manual Adult Toothbrushes available in India

Company Name	Product Name	Characteristics	MRP (Rs.)
Colgate	360°	<ul style="list-style-type: none"> ▪ Raised cleaning tip ▪ Tapered bristles ▪ Cushioned thumb grip ▪ Soft rubber polishing cups ▪ Soft textured cheek and gum cleaner 	70
	360° floss tip	<ul style="list-style-type: none"> ▪ 4x deeper reach ▪ Purple- ended bristles gently reach between tip teeth and along gum line 	95
	Charcoal gold 360°	<ul style="list-style-type: none"> ▪ Charcoal infused spiral bristles ▪ 17x slimmer gold colored bristle tips that inhibit bacteria built up on the bristles 	95
	Cibaca 1-2-3	<ul style="list-style-type: none"> ▪ End rounded bristles ▪ ZZ shaped bristles designed to clean deep in between teeth ▪ Tongue cleaner 	13
	Cibaca supreme	<ul style="list-style-type: none"> ▪ High quality imported bristles. ▪ Only hard variant available 	30
	Extra clean with power tip	<ul style="list-style-type: none"> ▪ A power tip that reaches and cleans the teeth at the back ▪ Specialized bristles for superior cleaning ▪ Advanced pearlized handle with colored ribs 	18
	Neo	<ul style="list-style-type: none"> ▪ Ultrasoft bristles. ▪ 2x bristles for effective cleaning 	50
	Sensitive	<ul style="list-style-type: none"> ▪ Ultra-soft bristles ▪ Flexible neck ▪ Rubber thumb grip 	30
	Sensitive +	<ul style="list-style-type: none"> ▪ Superior gentle cleaning ▪ Ultrasoft bristles ▪ Flexible neck 	50

		<ul style="list-style-type: none"> ▪ Rubber thumb grip 	
	Slim soft charcoal	<ul style="list-style-type: none"> ▪ Charcoal infused bristles. ▪ Slim tip bristles (Less than 0.01mm) 	75
	Slim soft sensitive	<ul style="list-style-type: none"> ▪ 17x slimmer tip bristles designed to sweep away food and plaque. ▪ Silky soft bristles 	75
	Super flexi	<ul style="list-style-type: none"> ▪ Flexible neck ▪ Tongue cleaner 	20
	Superflexi sensitive	<ul style="list-style-type: none"> ▪ Ultrasoft bristles ▪ Flexible neck ▪ Comfortable grip ▪ Inbuilt tongue cleaner 	25
	Zig –zag	<ul style="list-style-type: none"> ▪ Multi angle cross bristles ▪ International quality end rounded bristles ▪ Rubber cushioned handle ▪ Soft tongue cleaner and Flexible neck 	30
	Zig zag black	<ul style="list-style-type: none"> ▪ Multi-angle cross bristles reach deep between teeth to effectively remove plaque ▪ Premium international quality end rounded black bristles feel gentle on teeth and gums. ▪ Soft tongue cleaner. ▪ Rubber cushioned handle ▪ Flexible neck 	30
	Zig-zag neem	<ul style="list-style-type: none"> ▪ Multi angle cross bristles ▪ International quality bristles ▪ Soft tongue cleaner ▪ Neem infused bristles 	35
Oral-B	Classic super clean	<ul style="list-style-type: none"> ▪ Ripple bristles ▪ Effective cleaning ▪ Added comfort and control ▪ Ergonomically designed handle 	35
	Fresh clean	<ul style="list-style-type: none"> ▪ Dual bristle system- polishing center bristles (gently remove surface stains) and deep clean bristles (cleaning of tough spots) ▪ Z shaped bristles ▪ End rounded bristles ▪ Tongue cleaner 	20
	Pro health	<ul style="list-style-type: none"> ▪ Removes up to 90% of plaque with perfectly angled Crisscross bristles ▪ Power Tip bristles for cleaning the areas that are difficult to reach ▪ Gentle on enamel and gums ▪ Tongue cleaner 	50
	Pro health with neem extract	<ul style="list-style-type: none"> ▪ Neem infused bristles ▪ Removes up to 90% of plaque with perfectly angled Crisscross bristles ▪ Power Tip bristles for cleaning the areas that are difficult to reach ▪ Gentle on enamel and gums ▪ Tongue cleaner 	50
	Pro health anti-bacterial	<ul style="list-style-type: none"> ▪ Removes up to 90% of plaque in hard-to-reach places ▪ Anti-bacterial bristle protection to inhibit bacterial growth ▪ Power Tip bristles for cleaning the areas that are difficult to reach ▪ End-rounded bristles for cleaning the areas that are difficult to reach ▪ Stimulates gums ▪ Works gently on enamel and gums 	99
	Pro health sensitive	<ul style="list-style-type: none"> ▪ Removes up to 90% of plaque with perfectly angled Crisscross bristles ▪ Ultrathin bristles: 20x thinner bristle tips that stay gentle on gums and reach deeper between teeth vs. regular bristles ▪ Power Tip bristles help clean hard to reach areas ▪ End-Rounded Bristles are gentle on teeth and gums 	75
	Pro health sensitive charcoal	<ul style="list-style-type: none"> ▪ Removes up to 90% of plaque with perfectly angled Crisscross bristles ▪ Power Tip bristles for cleaning the areas that are difficult to reach ▪ Gentle on enamel and gums ▪ Tongue cleaner ▪ Charcoal infused bristles. 	90
	Pro health smart flex	<ul style="list-style-type: none"> ▪ Removes up to 90% of plaque with perfectly angled Crisscross bristles ▪ Power Tip bristles for cleaning the areas that are difficult to reach ▪ End-rounded bristles ▪ 2 flexing sides for superior cleaning ▪ Works gently on enamel and gums 	125
	Shiny clean	<ul style="list-style-type: none"> ▪ Carefully polished end rounded bristles ▪ Z shaped bristles ▪ Tongue cleaner 	20
	Sensitive whitening	<ul style="list-style-type: none"> ▪ Soft on gums and tough on plaque ▪ Unique cup shaped bristles for better reach inside the mouth ▪ Center bristles removes surface stains ▪ Outside bristles for sensitive gums 	45

	Ultrathin sensitive black	<ul style="list-style-type: none"> ▪ Ultrathin bristles: 20x thinner bristle tips stay gentle on gums and reach deeper between teeth ▪ Cup shaped bristles: precisely cover each tooth and provide a deep clean ▪ Dual bristles type: ultrathin bristles: 20x thinner bristle tips that stay gentle on gums ▪ Regular bristles: give you superior cleaning experience 	70
	Ultrathin sensitive green	<ul style="list-style-type: none"> ▪ Ultrathin bristles: 20x thinner bristle tips stay gentle on gums and reach deeper between teeth ▪ Cup shaped bristles: precisely cover each tooth and provide a deep clean ▪ Dual bristles type: ultrathin bristles: 20x thinner bristle tips that stay gentle on gums ▪ Regular bristles: give you superior cleaning experience ▪ Infused with green tea extracts 	46
	1-2-3 with neem extract	<ul style="list-style-type: none"> ▪ Z shaped bristles ▪ Bristles infused with neem extract. ▪ Tongue cleaner 	35
	Cavity defense 1-2-3	<ul style="list-style-type: none"> ▪ 3 ways clean- teeth, tongue and gums ▪ Cup shaped bristles ▪ Tongue cleaner 	25
	Cavity defense 1-2-3 black	<ul style="list-style-type: none"> ▪ 3 ways clean- teeth, tongue and gums ▪ Cup shaped bristles ▪ Tongue cleaner 	30
Sensodyne	Daily care	<ul style="list-style-type: none"> ▪ Specifically designed for people with sensitive teeth ▪ Soft end- rounded bristles ▪ Non-slip handle provides a secure hold 	30
	Deep clean	<ul style="list-style-type: none"> ▪ Specifically designed for people with sensitive teeth ▪ Micro-fine tapered filaments provide deep cleaning between teeth and gently remove plaque. ▪ Small soft brush head is specially designed to brush even the hard-to-reach areas in the mouth for a thorough clean 	70
	Sensitive	<ul style="list-style-type: none"> ▪ Specifically designed for with sensitive teeth. ▪ Soft rounded bristles ▪ Broad handle to ensure a comfortable grip ▪ Oval head and slim neck 	50
Pepsodent	Germi check	<ul style="list-style-type: none"> ▪ 3-Angled neck lets the Brush reach difficult areas for a healthy, whole mouth cleanse ▪ Unique bristles with PTFE (Polytetrafluoroethylene) for floss-like superior interdental cleaning action. ▪ Exclusive lamella toothbrush works with toothpaste to remove stains with each Brushing action 	65
	Gum expert 4x gentler	<ul style="list-style-type: none"> ▪ 3-Angled neck lets the Brush reach difficult areas for a healthy, whole mouth cleanse. ▪ Unique micro-bristle technology splits each bristle into multiple bristle tips for cushioning action. ▪ Cleans & massages simultaneously for healthy teeth & gums 	33
	Silver charcoal	<ul style="list-style-type: none"> ▪ Bristles infused with charcoal and silver ions ▪ Helps reduce 99.9% bacterial growth for 3 months ▪ Up to 0.01mm slim tip bristles ▪ 3 curved necks ▪ Tongue cleaner 	43
Patanjali	Sensitive	<ul style="list-style-type: none"> ▪ Made from DuPont Tynex Bristles Ultra soft bristles ▪ End Rounded Bristles. ▪ Non- Slip Rubberized Thumb Grip gives excellent control while brushing. ▪ Round handle for better grip while brushing 	30
	Sensitive +	<ul style="list-style-type: none"> ▪ Useful for those who need a delicate touch on their sensitive teeth and gums ▪ Its soft bristles tenderly dislodge food particles, remove stains and work on yellow spots, especially the ones that arise from smoking ▪ Its angular head helps you reach the farthest corners of your mouth and clear any debris that may be sitting there ▪ The non-slip rubberized grip 	30
	Soft	<ul style="list-style-type: none"> ▪ Soft bristles ▪ Economical 	10
	Triple action	<ul style="list-style-type: none"> ▪ Made from 100% DuPont bristles ▪ End- rounded bristles for safe and effective cleaning of teeth and gums. ▪ Soft gum stimulators stimulate and massage gums. ▪ Curved angular neck design reaches all corners of the mouth and cleans effectively ▪ Handle made from soft rubber and plastic with a cushion grip. ▪ Tongue cleaner 	25
Ajay	Comfort	<ul style="list-style-type: none"> ▪ Made from premium DuPont bristles. ▪ End- rounded bristles for gentle massaging of gums. ▪ Flexible neck designed to give better reach & more effective cleaning ▪ Soft tongue cleaner 	13
	Compact flexo	<ul style="list-style-type: none"> ▪ Made from premium DuPont bristles. ▪ Round-ended bristles massages gum gently. 	16

		<ul style="list-style-type: none"> ▪ Flexible neck for complete cleaning. ▪ Cleans and freshens mouth hygienically 	
	Complete premium	<ul style="list-style-type: none"> ▪ Made from premium DuPont bristles. ▪ A unique brush for complete care of your teeth and gums. ▪ Oval head with more bristles for better cleaning power. ▪ Rubberized handle for firm grip. ▪ Tongue cleaner 	18
	Interdental	<ul style="list-style-type: none"> ▪ V- Shaped bristles designed to reach deep between teeth, giving you excellent interdental cleaning. ▪ Round-ended bristles for extra gum and teeth protection ▪ Ergonomically designed handle for better reach and firm hold 	25
	Quest premium hard	<ul style="list-style-type: none"> ▪ Made from premium DuPont Tynex bristles ▪ Broader head with more bristles for excellent inter-dental cleaning ▪ Round-ended bristles for gentle care of teeth and gums. ▪ Oral hygiene at its best 	22
	Sensitive +	<ul style="list-style-type: none"> ▪ Made from premium DuPont Tynex bristles. ▪ Ultra-soft bristles. ▪ Rubber cushioned handle for easy grip, control and handle. ▪ Sensitive gum care like never before 	40
Aqua White	Active clean	<ul style="list-style-type: none"> ▪ Has innovative design that provides safe & superior cleaning experience. ▪ It has angular bristle tip that reaches every tooth to provide superior clean feel. ▪ Its central circular end rounded bristles are effective in cleaning surface stains from your teeth. ▪ Thin slender neck of this toothbrush reaches even the last tooth to clean each and every corner of your mouth effectively. ▪ The non-slip thumb grip provides excellent control while brushing to prevent any kind of tooth or gum damage. It is the most trusted oral care brand which keeps teeth clean and shiny 	35
	Carbon HD	<ul style="list-style-type: none"> ▪ Carbon infused bristles removes plaque effectively. ▪ Helps in preventing cavities thereby keeping the gums healthy. ▪ The slim head helps to reach every corner of the mouth effortlessly. ▪ The handle with anti-slip acupressure helps in a firm grip and even triggers the acupressure points 	59
	Twin guard	<ul style="list-style-type: none"> ▪ Twin Guard is an innovatively designed toothbrush and most trusted dentists' choice oral care brand that promises you a clean mouth and healthier gums. ▪ Its central circular cup bristles are effective in removal of stain and plaque from teeth. ▪ Its long bristle helps to clean food particles stuck in between your teeth. ▪ Its non-slip thumb grip provides excellent control over toothbrush. ▪ Tongue cleaner 	24
Perfect	Power	<ul style="list-style-type: none"> ▪ Extra hard toothbrush ▪ Tongue cleaner 	12
Cello	Flexy	<ul style="list-style-type: none"> ▪ Made from soft bristles ▪ Rubberized handle for a firm grip 	30
Vestige Dent Assure	Adult toothbrush	<ul style="list-style-type: none"> ▪ End round bristles reach between teeth to remove plaque and food particles ▪ Gently cleans the teeth & massages gums ▪ Has a unique tongue cleaner for better oral health ▪ Is made with 100% DuPont bristles provides superior all-round cleaning of the entire mouth 	61
Jordan	Classic	<ul style="list-style-type: none"> ▪ Rounded bristles. ▪ Spoon shaped handle 	60
	Ultimate You	<ul style="list-style-type: none"> ▪ Active tip reaches and cleans difficult areas. ▪ End-rounded bristles ▪ Non-slip grip ▪ Many colour choices available 	35
Apollo	Popular	<ul style="list-style-type: none"> ▪ Premium DuPont Tynex Bristles ▪ Rubberized handle for firm grip ▪ High Grade Virgin plastics for maximum hygiene ▪ Tongue cleaner 	22
Sri sri tatva	Complete premium	<ul style="list-style-type: none"> ▪ Made from premium DuPont bristles ▪ Rubber handle grip ensures easy control and better reach ▪ Tongue Cleaner 	25
Anchor	Wave	<ul style="list-style-type: none"> ▪ Made from DuPont bristles. ▪ End rounded bristles effectively protects your gums and your teeth enamel. ▪ A comfortable grip. ▪ Provide a great all-round cleaning 	12
Royal	Sensitive	<ul style="list-style-type: none"> ▪ Made from DuPont bristles ▪ Flexible neck ▪ Long head Soft Bristles 	40
Collage	Sensactive 365	<ul style="list-style-type: none"> ▪ Specially designed handle for firm grip 	20

		<ul style="list-style-type: none"> ▪ 365 Days protection for sensitive teeth 	
Cobor	Deep clean	<ul style="list-style-type: none"> ▪ Rounded bristles ▪ Gives you better interdental cleaning 	40
Classic	Super clean	<ul style="list-style-type: none"> ▪ Thumb Rest Grip ▪ Soft Brush ▪ Rounded Bristles ▪ Tongue Cleaner 	20
Maxi	Champion	<ul style="list-style-type: none"> ▪ Excellent for gentle cleaning of the sensitive teeth ▪ End – rounded bristles for safe brushing ▪ Complete gum protection 	30
	Hunter	<ul style="list-style-type: none"> ▪ Excellent for gentle cleaning of the sensitive teeth ▪ Available in all colours 	30
	Tiger	<ul style="list-style-type: none"> ▪ End –rounded bristles for safe brushing ▪ Complete gum protection 	30
White & fresh	Luxuria	<ul style="list-style-type: none"> ▪ High Quality bristles ▪ Soft bristles ▪ Tongue cleaner 	45
Ivory	Deep clean	<ul style="list-style-type: none"> ▪ Made from polypropylene material ▪ Nylon bristles ▪ Soft bristles for safe brushing 	25
	TUBE	<ul style="list-style-type: none"> ▪ Supplied in a specially designed tube ▪ Made from polypropylene material ▪ Nylon bristles ▪ Soft bristles for safe brushing 	30
Pal mark	Maxcare	<ul style="list-style-type: none"> ▪ Rubberized handle for firm grip ▪ Nylon Bristles ▪ Soft bristles for gentle cleaning 	35
Kasili	Adult Toothbrush	<ul style="list-style-type: none"> ▪ 0.01mm ultra soft bristles ▪ Helps in better inter-dental cleaning 	15
Cola health care	Adult Toothbrush	<ul style="list-style-type: none"> ▪ Soft bristles ▪ Efficiently cleans even the inter-dental areas 	40
Qiqiao	Adult toothbrush	<ul style="list-style-type: none"> ▪ Very fine elastic bristles ▪ 0.02mm soft bristles ▪ Compact and flexible brush head design ▪ Stylish and non-slip handle 	30
Vinsa	Adult toothbrush	<ul style="list-style-type: none"> ▪ Medium bristles ▪ Available in multiple colors 	25
O-mex	Whole mouth clean	<ul style="list-style-type: none"> ▪ Soft bristles ▪ Specially designed handle to protect the gentle gums ▪ 3x cleaning 	20
Coolday	Black z-zag	<ul style="list-style-type: none"> ▪ Zig-Zag bristles to help better inter-dental cleaning of teeth ▪ Specially designed handle to protect the gentle gums 	21
	1000	<ul style="list-style-type: none"> ▪ Made from soft bristles ▪ Firm grip for proper brushing 	20
	Gold 2000	<ul style="list-style-type: none"> ▪ Medium bristles ▪ Rubberized handle for a good grip 	22
Life time	Adult Toothbrush	<ul style="list-style-type: none"> ▪ Made from premium soft bristles ▪ Multi-action for extra clean teeth and gums ▪ Rubberized handle for a firm grip 	40
Vico	Senso Clean	<ul style="list-style-type: none"> ▪ Available in soft bristles, thinner handle for better hold ▪ Tongue cleaner 	40
	Power Clean	<ul style="list-style-type: none"> ▪ Medium bristles for effective cleaning of teeth & gums ▪ Tongue cleaner 	35
	Action Clean	<ul style="list-style-type: none"> ▪ Better reach to all areas of mouth ▪ Tongue cleaner 	22
	Value clean	<ul style="list-style-type: none"> ▪ Multi-angle cross bristles ▪ 100% imported bristles ▪ Rounded bristles ▪ Tongue cleaner 	18

Table 2: Information related to Manual Kids Toothbrushes available in India

Royal	Speed	<ul style="list-style-type: none"> ▪ Specially designed for children who are learning to brush ▪ Extra soft bristles which work gently on their developing teeth ▪ Available in multicolor 	40
K-shore	No 615	<ul style="list-style-type: none"> ▪ Soft bristles ▪ Double clean- Feather brush design, soft extraordinarily, double care of your gums ▪ Cartoon handle- natural wheat straw 	80
Oral-b	Kid's	<ul style="list-style-type: none"> ▪ Extra –soft bristles 	20

		<ul style="list-style-type: none"> ▪ Carefully polished end-rounded bristles that are gentle on teeth and gums ▪ Handle stabilizer ▪ Power tip bristles 	
Colgate	Kids 0-2	<ul style="list-style-type: none"> ▪ Extra soft bristles ▪ Small head ▪ Longer and non –slip handle 	30
	Kids 2+	<ul style="list-style-type: none"> ▪ Rounded head ▪ Multilength extra soft bristles ▪ Makes brushing fun due to character toothbrushes 	20
	Minions	<ul style="list-style-type: none"> ▪ Multilength bristles to clean small and big teeth ▪ Raised tip to clean hard to reach back teeth ▪ Suction cup for easy and fun upright storage 	75
	Ultimate spiderman	<ul style="list-style-type: none"> ▪ Multilength bristles to clean small and big teeth ▪ Raised tip to clean hard to reach back teeth ▪ Suction cup for easy and fun upright storage 	75
Ajay	Baby care	<ul style="list-style-type: none"> ▪ Ultra-soft DuPont bristles for gentle gum care ▪ Colored bristles indicate the optimum amount of toothpaste to be used ▪ Non- slip grip for better control ▪ Head covered with soft material to protect your child's gums 	18
	Complete junior	<ul style="list-style-type: none"> ▪ Made from premium DuPont bristles ▪ Scientifically designed non-slip handle with thumb slot to provide controlled and firm handling ▪ Soft and rounded bristles ▪ Oval head to ensure thorough cleaning 	18
	Flexo junior	<ul style="list-style-type: none"> ▪ Made from premium DuPont bristles ▪ Soft-end rounded bristles for gentle gum care ▪ Flexible neck 	12
Chicco	Kid's	<ul style="list-style-type: none"> ▪ Soft non-toxic material ensures no irritation to your kid's gentle gum ▪ Soft bristles facilitate painless removal of oral dirt and germs ▪ Ergonomic handle helps your baby have a good grip 	179
Johnson's baby	Kid's	<ul style="list-style-type: none"> ▪ Safe for a baby's oral care. ▪ Special thumb groove makes handling easy for mother ▪ Featured with a broad handle to ensure your baby's safety 	30
Patanjali	Junior	<ul style="list-style-type: none"> ▪ Rubber --grip handle fits kid's hands for control while brushing ▪ Junior handle makes brushing fun 	15
Aqua White	Chota bheem	<ul style="list-style-type: none"> ▪ Made with Premium Soft Bristles which are gentle on kid's teeth & gums. ▪ Narrow, small head is comfortable in small mouth. ▪ Uniquely shaped handle is comfortable to grip for small hands. ▪ Unique First Time in India Chhota Bheem brand Kids Toothbrush. ▪ Beautiful toothbrush with Kids favorite character on the brush that will prompt them to brush on their own 	39
	Kid's	<ul style="list-style-type: none"> ▪ Superior bristles ▪ Comfortable subtle head that reaches every corner of the mouth ▪ Non-slippery rubberized handle ▪ Suction cup to place brush upright for better hygiene 	25
Maxi	Kid's	<ul style="list-style-type: none"> ▪ Made with Premium Soft Bristles which are gentle on kid's teeth & gums. ▪ Cartoon handle to attract the kids 	20
Denta check	Kid's	<ul style="list-style-type: none"> ▪ Made from Soft bristles ▪ Gentle on teeth ▪ Cartoon handle ▪ Available in multiple colors 	10
X brush	Kid's	<ul style="list-style-type: none"> ▪ Soft bristles for gentle cleaning of teeth ▪ Bristles made of nylon ▪ Anti-bacterial coating 	20
Orra	Chicken	<ul style="list-style-type: none"> ▪ Made from soft bristles ▪ Chicken cartoon on the handle to attract children 	15
Soft n fresh	Junior	<ul style="list-style-type: none"> ▪ Made from soft bristles ▪ Nylon bristles ▪ Tongue cleaner ▪ Attractive handles 	15
Coolday	Kid's	<ul style="list-style-type: none"> ▪ Superior soft bristles ▪ Cartoon handles which will prompt kids to brush ▪ Gentle to kids' teeth and gums 	15
You&me	Kid's	<ul style="list-style-type: none"> ▪ Soft bristles for gentle cleaning ▪ Cartoon characters on the handle to attract kids 	12
Ojas	Kid's	<ul style="list-style-type: none"> ▪ Round ended filaments ▪ Excellent cleaning ▪ Easy grip handle 	12
Lotus –flex	Fish soft	<ul style="list-style-type: none"> ▪ Rounded polished bristles gently massage gums and protect enamel ▪ Rounded cone head of the brush can go deep cleaned position and scrub it up 	20

		<ul style="list-style-type: none"> ▪ The tooth can be put placidly and it is easy for children to put toothpaste on it ▪ Rubber grip handle for better control ▪ Soft bristles 	
	Fish	<ul style="list-style-type: none"> ▪ Specially shaped head provides comfortable and easy access to back teeth for effective brushing. ▪ Elastic rubber neck ideally designed for better control and absorb excessive pressure while brushing ▪ New nylon filaments with rounded ends help to protect tooth enamel and gums. ▪ Comfort rubber injected grip for safe and stable brushing free from sliding 	35

Discussion and conclusion

The toothbrush has undergone a great degree of sophistication^[21] and is by far the most widely accepted and adopted tool for cleaning teeth. The ultimate goal of toothbrushing is to disrupt the dental plaque biofilm and clean the oral cavity properly. Since its introduction and particularly in the last decade, numerous designs of the manual toothbrush have emerged and the media abounds with claims of superiority in plaque removal by individual brands. To achieve this goal of superior tooth cleaning, the toothbrush should have a necessary design which includes adaptation to all surfaces of the tooth (facial, lingual, occlusal, and proximal surfaces) to produce effective cleaning motion with no deleterious effects on hard and soft tissues. As seen from the data available, toothbrushes in the Indian market are available with variety of special design features of handle, head, filaments etc. This which we suppose, very well reflect people's understanding of the requirements of effective toothbrushes and have a great potential to fulfill the motive towards better maintenance of oral hygiene. Patients who have not received any professional advice regarding the type of brush to be used for cleaning, usually choose brushes based on cost, availability, advertising claims, family tradition or habit. The various designs of toothbrushes available in the market often put the common man in dilemma about the best design and they often seek professional advice on this matter. Because of the varieties of brushes currently available and the constant development of new brushes, the dental professionals must possess a high level of knowledge of these products and should advice the patients appropriately. It is also suggested that people should select the appropriate toothbrush based on factors such as advice by the dentist, oral health education, attitude towards oral health, economical aspects etc.

Clinical relevance

Scientific rationale

This study was conducted to assess and present the information about the manual toothbrushes commercially available in the Indian market.

Principal finding

Total of 107 toothbrushes were collected and assessed for their features and cost. Toothbrushes are available in various designs and shapes of bristles, bristle tips, handles with variety of grip, etc.

Practical implication

This will help people in selection of appropriate toothbrush based on their needs and various factors as discussed earlier.

Conflict of interest

No funding was received and no conflict of interest is

present.

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