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Erudite Women's Outstanding Contribution to the Indian Medical Education: A Recognition on International Women's Day 2021

By Manishi Bansal and Shashi Raheja

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Keywords: *medical education, women empowerment, medical textbooks, international women's day.*

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ERUDITEWOMENSOUTSTANDINGCONTRIBUTIONTOTHEINDIANMEDICALEDUCATIONARECOGNITIONONINTERNATIONALWOMENSDAY2021

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Erudite Women's Outstanding Contribution to the Indian Medical Education: A Recognition on International Women's Day 2021

Manishi Bansal [α] and Shashi Raheja [σ]

Abstract- Women education is the first and the most important step towards attaining women empowerment. Writing and publishing textbooks for medical education is a challenging work, especially by women. This article intends to compile personal information and books published by women in different specialities so as to give recognition to such women on this International Women's Day. Forty women were shortlisted who have either written or edited textbooks, out of which gynaecology and anatomy were the dominant specialities where contribution of the women was seen maximum. Along with textbooks, these women have many publications in indexed journals and are the recipient of famous awards in their fields. Contributions of these empowered women should be documented more often in literature so that more and more younger women get to know them.

Keywords: medical education, women empowerment, medical textbooks, international women's day.

I. Introduction

Women empowerment means the action of raising the status of women through education, literacy, and training [1]. Empowerment of women and achieving gender equality is essential for our society to ensure the sustainable development of the country and literacy is the foremost important step towards attaining it. This was aptly realised long back in early 19th century by two Indian women, Anandibai Gopalrao Joshi and Kadambini Ganguly [2]. They were the first two Indian women to study medicine during British Empire. Anandibai Gopalrao Joshi (1865-1887) graduated with a two-year degree in western medicine from Woman's Medical College of Pennsylvania, United States in 1886. At the age of fourteen, Anandibai gave birth to a boy, but the child died after ten days due to lack of medical care. This proved to be a turning point in Anandi's life and inspired her to become a physician [3]. After her medical training, she returned to India to practice medicine as she believed that midwifery was not sufficient to save lives. Unfortunately, Anandi died at an early age of 22 years due to tuberculosis. Kadambini Ganguly (1861-1923) graduated from Calcutta Medical College in 1886 despite strong criticism from the society opposing women liberation. She became the first woman physician with a western medical degree in the whole of South Asia[4]. In 1893, she also travelled to UK for higher studies. Since then, these two women have been the guiding light for many other women to study medicine.

Since 1914, International Women's Day on 8 March is a global day celebrating the economic, political, and social achievements of women in the past, present and future [5].In the last 60 years, increasing numbers of women doctors in India have contributed to the medical academics by writing textbooks for medical and para-medical students. However, not much information is available on Google about authors of textbooks who have spent quite a few years of their life writing books for academic purposes. The scenario is worse when it comes to women. Therefore, on this International Women's day, this article intends to honour Indian women authors who have contributed to medical education by publishing textbooks for the students. This is the first of its kind article published so far.

II. Methodology

The methodology used in this article is mainly based on personal communication and Google Scholar. Subject wise, we searched for medical books authored by women and contacted them telephonically and via email. We also contacted head of the departments of various institutes and asked them for information on women authors in their peer group. Then they were also contacted personally. In this way we formed a chain and asked them if they knew other women authors. Medical students were also contacted and inquired about the books they prefer to read and why. We even contacted famous publishers who have published books written by women. Simultaneously, online search was also carried out for medical textbooks available and then shortlisted for books by women. The authors were then sent a proforma by email asking for their personal details and the books published by them. The data was then compiled over a period of two months.

III. Results

A total of 40 women authors were sent the proforma. All authors who have written or edited textbooks for medical as well as para-medical students

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were included in the analysis whereas authors who have exclusively written practical books and viva books were excluded from the analysis. Subject wise, maximum contribution of women authors was seen in the field of gynaecology (13 authors), followed by anatomy (8 authors) and other clinical and non-clinical specialties [Table1]. Institute wise, maximum contribution is from alumni of Lady Hardinge Medical College (LHMC), New Delhi and All India Institute of Medical Sciences (AIIMS), New Delhi (12 authors each), and Maulana Azad Medical College, New Delhi (4 authors). Textbooks are singly authored in 22cases and more than one author contributed in18 books. Twenty-three women authors have published more than one book whereas 16 have published single book. Presently, out of 40 women, 10 have retired from their respective specialty and 30 women are still working.

IV. Pioneer Women in Various Medical Fields

Here is a subject wise abridged information of women authors who by publishing textbooks for medical education have created a dent in their respective fields.

a) Anatomy

Human body has been intriguing to mankind since ages. Andreas Vesalius (1514-1564) who is known as the "Father of anatomy", made significant anatomical discoveries with his observations and documented them in textbooks [6]. In the same way, some prominent women anatomist of India have written textbooks to simplify the subject of anatomy for the medical and paramedical students.

1. Dr. Krishna Garg

Known as a Legend of Anatomy, Dr Krishna Garg was born on 12th July 1938.She did her MBBS from Lady Hardinge Medical College (LHMC), New Delhi in 1961 followed by MS in 1968. She also completed PhD in anatomy in 1993 from the same college. She became faculty there and later retired in 1996 from LHMC as Professor and Head of the department of anatomy [7].Furthermore, she did not stop here and continued to teach in many medical, dental and physiotherapy colleges. She has been awarded with many prestigious awards like lifetime achievement award of anatomy, Nations who's who (2019) and Excellence award in anatomy in 2004 by Delhi Medical association for her selfless dedication and research excellence. Dr Krishna has published many textbooks for medical curriculum. Among them the noted ones are- *Textbook of Histology* (second to sixth edition, by CBS Publishers), *Textbook of Neuroanatomy* (first to sixth edition, by CBS Publishers), *B D Chaurasia's Handbook of General Anatomy* and many more. Besides this, she has been editing the famous textbook of anatomy by B D Chaurasia (4thto 8th edition) which is widely read by medical students all over the world.

2. Dr. Neeta V Kulkarni

Dr Neeta V Kulkarni is another iconic woman in the field of anatomy. She has graduated from Government Medical College, Nagpur, and post-graduation in anatomy from Government Medical College, Thiruvananthapuram. She has worked in various medical colleges of Kerala and has been a lifetime member of many anatomical societies of India. Her textbook, *Clinical Anatomy, A Problem Solving Approach,* was first published by Jaypee Brothers in 2006 [8]. Currently this book is in third edition. This book is designed to provide exposure on day-to-day applications of anatomy in clinical settings and analyses. Dr Kulkarni passed away at her home in Pune in 2019.

3. Dr. Rani Kumar

Dr Rani Kumar MBBS (1969), MS, FAMS is a renowned woman who has retired as Professor and Head of anatomy, and Dean of AIIMS, New Delhi. She has a total of 40 years of teaching experience in anatomy. To help the undergraduate students understand embryology, she simplified it and wrote a *Textbook on Human Embryology* [9]. Dr Rani has written another textbook by the name *Synopsis of Anatomy with MCQ and Mnemonics.* She has many awards and achievements to her name, like the lifetime achievement award from AIIMS in 2016, Distinguished Teachers' award by Delhi Medical association in 1992 and PN Dubey memorial gold medal in 1992. She was also awarded Fogarty International Fellowship at National Institute of Health, Bethesda, USA.

4. Dr. Veena Bharioke

Retired as Professor and Head of the department of anatomy from University College of Medical Sciences, New Delhi, Dr Veena is a prominent figure in her field. She is MBBS from Gandhi Medical College, Bhopal in 1971 and MS anatomy from AIIMS, New Delhi in 1974. She has published a *Textbook Of Histology With A Practical Manual And Colour Atlas, second edition in 1995* and also *Textbook on Human Histology* published in 1999.

5. Subhadra Devi Velichety

Born in 1955, Dr Subhadra did her MBBS in 1979 and MS in 1985 from Sri Venkateswara (S.V) Medical College, Tirupati. She has worked as Professor and Head, Department of anatomy at the same college. Presently, she is working as Professor of Anatomy, Apollo Institute Medical Science and Research, Chittoor, Andhra Pradesh. She has vast experience in the field of teaching anatomy, research, histology and genetics. She has edited a famous textbook of a great anatomist of India namely, *Inderbir Singh's Human Embryology*, published by Jaypee Publishers [10]. Another book is *Textbook of General Anatomy,* also published by Jaypee

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Publishers in 2019. This book provides basic knowledge for the dissection of cadaver and study of various organs adopting integrated approach. Besides this she has numerous publications in indexed journals.

6. Dr. Mrudula Chandrupatla

Dr Mrudula (MBBS, MD) is Professor and Head of the department of anatomy at Apollo Institute of Medical Sciences and Research, Hyderabad. Along with publications in renowned journals, she has written many books for medical as well as physiotherapy students. Among them, the famous ones are-*Handbook of Muscles*, published by Osmania Publisher and has three editions. *Concise Anatomy* has two editions and *Anatomy for BPT* is published in 2015 [11].

7. Dr. Daksha Prashant Dixit

Having done MBBS from K.J Somaiya Medical College, Mumbai in 1998, Dr Daksha is Professor in the department of anatomy, Jawaharlal Nehru Medical College, Belagavi. She has written 2 textbooks-*Textbook of Human Embryology for undergraduate and postgraduate students*, published by CBS Publishers in 2004 [12]. Another textbook is *General anatomy for undergraduate medical and paramedical students,* published in 2001. She wrote these books to simplify embryology and anatomy for the medical and para-medical students.

8. Dr. Renu Chauhan

Dr Renu Chauhan MBBS (1990), MS is Professor and Head of the department of anatomy at University College of Medical Sciences Hospital (UCMS), New Delhi. She has published textbooks on genetics, histology and anatomy for medical students as well as nursing. The textbook *Essentials of Genetics* is published by Avichal publishing company and the first edition came in 2014 [13]. This book aims at providing the students with the basic concepts of genetics, prenatal diagnosis and important techniques in genetics. She is also the joint editor of journal of Anatomical Society of India and has many publications in her name.

b) Physiology

Physiology is the science of life. It is the branch of biology that aims to understand the mechanisms of living things, from the basis of cell function at the ionic and molecular level to the integrated behaviour of the whole body and the influence of the external environment. Two prominent women in this field are-

1. Dr. Surrinder Himmat Singh

Dr Surrinder is the oldest among all women. She was borne in 1935. She did her MBBS and MD from LHMC, New Delhi. She retired as ex-Professor and head of the Department of Physiology at LHMC. She has received various awards and recognitions. She has authored 4 textbooks for medical and paramedical students, these are- *Anatomy and Physiology for Nurses and Allied Health Sciences.* This book is also co-authored by Dr Krishna Garg. *Principles of Human Physiology for Paramedical Courses, Principles of Human Physiology courses in Nurses and Allied Health Sciences* and *Manual of Practical Physiology* [14].

2. Dr. Indu Khurana

Presently working as Dean cum Principal of World College of Medical Sciences & Research and Hospital, Jhajjar, Dr Indu is MBBS (1977) and MD Physiology (1982) from Post Graduate Institute Medical College (PGIMS), Rohtak. She has worked as Professor and Head of Department of Physiology there and also held various administrative positions. She has published 11 books in physiology for medical and para-medical out of which the *Textbook of Medical Physiology* published by Elsevier (2nd edition 2015) is famous among medical students. For her dedicated works in academics, she has received lifetime achievement award in 2018.

c) Biochemistry

Biochemistry is the branch of science that explores the chemical processes within the human body. It is a laboratory based science and is a fusion of biology and chemistry. The prominent women in this field are-

1. Dr. Sreekumari S

Dr Sreekumari was born in 1949, she did her MBBS in 1972 and MD in biochemistry in 1977 from Medical College Thiruvananthapuram, Kerala. She has held various faculty positions and later retired in 2004 as Professor and Head of the Department of biochemistry from the same college. She is the co-author of 3 books published by Jaypee Medical Publishers –*Textbook of Biochemistry for Medical Students,* first edition published in 1995 and 9th edition released in 2019 [15]. This textbook is accepted as one of the standard textbooks by The Medical Council of India (MCI) and is famous not only in India but other Asian countries also. This book has a Spanish edition also. Other textbooks are-T*extbook of Biochemistry for Dental Students,*3rd edition and *Clinical Chemistry Made Easy*.

2. Dr Veena Singh Ghalaut

Born in 1954, Dr Veena did MBBS from Raipur in 1978 and MD in biochemistry in 1982.She is presently Professor and Head of the department of biochemistry at PGIMS, Rohtak. She has more than 100 publications in national and international journals and has been the president of the Association of Medical Biochemist of India from 2009-10. She has authored 3 books in biochemistry based on MCI syllabus-*Practical book/ Manual of Biochemistry for MBBS, Practical book/ Manual of biochemistry for BDS, and Practical Skills in Biochemistry*[16].

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3. Dr. Poonam Agrawal

Dr Poonam has done MBBS in 1997 and MD in biochemistry in 2007 from Madras Medical College. She is presently working as Professor and Head of the department of biochemistry at Dr Baba Saheb Ambedkar Medical College and Hospital, Delhi. She has written 4 textbooks of biochemistry– *Concepts in Biochemistry with Clinical Approach*, first edition 2020 - this book helps the medical students to understand the basis of disease at metabolic and molecular level [17]. *Textbook of Biochemistry based on CBME*- this textbook is written in more elaborative fashion for the medical undergraduates. *Review of Biochemistry for PGMEE*, first edition 2012- this book helps the post graduate aspirants for the correct and easy approach to the subject of biochemistry. This book is currently in 5th edition. *Practical Biochemistry with Clinical Approach*- this book is written to make the concept of practicals in biochemistry clear for the medical students and to understand the clinical importance of the subject.

d) Pathology

Pathology is a branch of medical science that involves the study and diagnosis of disease through the examination of surgically removed organs, tissues and body fluids. Some pioneer women in the field of pathology are -

1. Dr. Chitra Sarkar

Dr Chitra Sarkar is a prominent name in the field of pathology. She is presently Professor and Head of the department of pathology at AIIMS, New Delhi. She did her MBBS from Bangalore Medical College in 1978 and MD pathology from AIIMS, New Delhi in 1981. She has written a book on neuropathology by the name *Essentials of Diagnostic Surgical Neuropathology,* first edition came in 2017 and was published by Thieme[18]. She wrote this book because of the nonavailability of a concise surgical neuropathology book in the Indian context specially for practicing pathologist. Besides this she has more than 400 publications in her name out of which 193 are from neuro-oncology. She has also written 34 chapters in various books.

2. Dr. Sunita Sharma

Dr Sunita Sharma MBBS and MD in pathology from King George's Medical College, Lucknow. She is presently the Director, Professor and Head of the Department of pathology at LHMC, New Delhi. The name of her book is *Concise Haematology* published in 2018 [19]. This book is considered as the nutshell of haematology and transfusion medicine for undergraduate medical students.

3. Dr. Vandana Puri

Dr Vandana has done MBBS in 2006 from Coimbatore Medical College, Tamil Nadu and MD in Pathology from LHMC in 2010, New Delhi. Presently she is working as Associate Professor there. The name of her book is *Complete Review of Pathology and Haematology for NBE*. She wrote this book with the idea to simplify pathology for undergraduate students.

4. Dr. Ila Tyagi

Dr Ila has done MBBS from Bangalore Medical College in 1999. She is presently Associate Professor of pathology at North Delhi Municipal Corporation Medical College and Hindu Rao hospital, New Delhi. Her textbook is *Essentials of Gross Pathology* published by CBS publishers [20].

e) Microbiology

Microbiology is the study of microscopic organisms and includes fundamental research on them.

Dr. Seema Sood

Dr Seema Sood is Professor in the Department of Microbiology at AIIMS, New Delhi. She has written a book by the name *Microbiology for Nurses* published by Elsevier, 3rd edition [21]. The fact that nursing students needed a book that is more pertinent for their duties, inspired her to write this book. She has published extensively in international and national journals and is recipient of many scholarships and awards.

f) Pharmacology

Pharmacology is a pertinent branch of medicine and pharmaceutical sciences which is concerned with the study of drug or medication action.

Dr. Padmaja Udaykumar

Dr Padmaja is presently head of the department of pharmacology at Father Muller Medical College (FMMC), Mangalore. She did her MBBS from Government Medical College, Bellary in 1987 and MD from Kasturba Medical College, Manipal in 1991. She has many publications in her name. Besides academics, she has also held administrative positions at FMMC. She has written many books of Pharmacology, the noted ones are - *Medical Pharmacology for Medical Students* published by CBS publishers, 6th edition 2020 and *Exam Preparatory Manual for Undergraduates in Pharmacology* by Jaypee Brothers Medical Publishers, 2019 [22].

g) Obstetrics and Gynaecology

The field of obstetrics and gynaecology has been dominated by women since ages since female patients feel more comfortable being treated by their female counterparts. Fortunately, India has produced many stalwarts in obstetrics and gynaecology who have contributed hugely in their field of specialisation. Among them are-

1. Dr. VG Padubidri

Among them the first name is Dr VG Padubidri who has authored as well as edited the famous *Howkins & Bourne Shaw's textbook of Gynaecology*. Dr Padubidri completed her MBBS in 1958 from Topiwala National Medical College, Mumbai and MS in 1962. Thereafter

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she worked at MAMC, New Delhi from 1974-1984 and later became Director, Professor and Head of department of obstetrics and gynaecology, LHMC, New Delhi from where she retired in 1991. Shaw's textbook of Gynaecology, authored by VG Padubidri and SN Daftary, is one of the best-selling obstetrics and gynaecology textbooks of all time [23].The main objective of this book is to meet the needs of undergraduate medical students and those preparing for postgraduate entrance examination. This book was first published in 1936 and presently 17th edition of the book came in 2018. The book is published by Reed Elsevier India Private Limited.

2. Dr. Shubha Sagar Trivedi

Dr Shubha has retired as Professor and Head, department of obstetrics and gynaecology from LHMC, New Delhi. She has more than 80 research papers in her name along with two books, namely *Management of High Risk Pregnancy, A practical approach*, second edition and *Anaemia in Pregnancy* [24]. Dr Manju Puri and Dr Swati Agarwal are two other editors of this book. This book deals with prenatal diagnosis of obstetrics and gynaecology disorders in pregnancy, complications in pregnancy and effect of various medical conditions in pregnancy like anaemia and diabetes. She wrote these books with the aim to pass on her vast knowledge of dealing with difficult and challenging cases to the students.

3. Dr. Sudha Salhan

The next prominent women in the field of obstetrics and gynaecologyis Dr Sudha Salhan, who did her MBBS from Government Medical College Srinagar and MD from Banaras Hindu University, Varanasi. She retired as Professor and Head of the department from Vardhman Mahavir Medical College (VMMC) and Safdarjang Hospital, New Delhi. She has edited three textbooks, namely *Textbook of Obstetrics* second edition in 2016*, Textbook of Obstetrics and Gynaecology* fourth edition in 2011, and *Women and HIV* second edition in 2013 for which she was awarded FOGSI prize. The book *Women and HIV* is a comprehensive book about the HIV infection in females, emphasizing about mother-to-child transmission, postexposure prophylaxis and biosafety measures.

4. Dr. Suneeta Mittal

Dr Suneeta Mittal MBBS (1972) and MD (1977) from LHMC, New Delhi, is presently Director and Head, department of obstetrics and gynaecology, Fortis Memorial Research Institute, Gurugram [25]. She has been former head of the department of obstetrics and gynaecology and Director of WHO-CCR in human reproduction at AIIMS, New Delhi. She has worked hard to uplift women's health in various ways like introduction of emergency contraception in India, introduction of medical abortion guidelines and minimum standards for mother-baby friendly health care facility. For her achievements, she has been profiled in "The Lancet" as crusader for women's health in India. She has written 15 books on topics like contraception, abortion, mother-child health along with WHO and UNICEF. Out of them her latest textbook is *Obstetrics and Gynaecology, The 5-minute consult 2020.*

5. Dr. Shakuntala Baliga

Dr Shakuntala is MBBS and MD in obstetrics and gynaecology from AIIMS, New Delhi. She is presently Professor and Chief of Colposcopy at Mazumdar Shaw Medical Center, Bengaluru. She has worked mainly on colposcopy and has authored three textbooks on colposcopy, the most famous is *Principles and Practice of Colposcop*y, second edition, published by Jaypee Publishers.

6. Dr. Neerja Goel

Dr Neerja Goel is a well-known name in the field of gynaecology. She is Professor and Unit head of the department of obstetrics and gynaecology at Sharda Hospital, Greater Noida. She has written numerous books in her field of specialization. Among them the popular textbooks are C*urrent Practice in Obstetrics and Gynaecology,* published by Young Brothers in 1999*, Advances in Obstetrics and Gynaecology,* published by Jaypee Brothers in 2006, others are a book on *Menopause, Contraception and State of Art Vaginal Surgery* [26]. She wrote all these books with the intention of imparting her knowledge to the readers.

7. Dr. Mala Arora

Dr Mala is presently consultant obstetrics and gynaecology at Fortis La Femme, New Delhi. She has done MBBS from LHMC in 1978. She is the author of 8 books, the famous ones are- *Year book in Obstetrics and Gynaecology*, 2018-2020, *First Trimester in Pregnancy* published by Jaypee Publishers in 2017 and *Recurrent Pregnancy Loss,* first to third edition. She has numerous publications in her name and has been invited to deliver more than 400 talks at national and international conferences.

8. Dr. Pratima Mittal

Dr Pratima is former Head of the department of obstetrics and gynaecology, VMMC, New Delhi. She has authored four textbooks along with her colleagues- *A practical manual of Obstetrics and Gynaecology*, published in 2001. This book is about instruments and procedures for undergraduates and postgraduate students, *Practical Approach to Critical Care Obstetrics*, published in 2017 and *FOGSI Focus: Surgical Skills in Obstetrics and Gynaecology,* published in 2018. This book also includes surgical videos, and the latest textbook is *FOGSI handbook of Antenatal Care*, published in 2020.

9. Dr. Manju Puri

Alumni of PGIMS, Rohtak, Dr Manju Puri is currently the Director, Professor and Head of the

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department of obstetrics and gynaecology at LHMC, New Delhi. Her textbook, *Clinical Methods in Obstetrics and Gynaecology* is written to guide the students on systematic approach with specific presenting complaints in obstetrics and gynaecology. This book is basically a compilation of bedside teachings during clinical rounds.

10. Dr. Surveen Ghumman

Dr Surveen Ghumman is another icon in the field of obstetrics and gynaecology. She is graduate from Christian Medical College (CMC), Ludhiana in 1986 and postgraduate from Amritsar Medical College in 1991. She is presently Director and Head, department of IVF and Reproductive Medicine at Max group of Hospitals, New Delhi. Dr Surveen takes the credit of authoring 8 books, out of which 6 books are on infertility and 3 books have been published internationally. Her latest book is *Principles and Practice of Ovarian stimulation in ART,* published by Springer in 2015. Her books, *Step by Step Ovulation Induction, Tubo-uterine Factors in Infertility* and *Non- Descent Vaginal Hysterectomy* (co-authored by Dr Neerja Goel) have been published in UK as well. Her passion for the subject of infertility and translating knowledge into a logical sequence to help many others to follow and practice, was what kept her inspired. Also, she wanted to translate both evidence- based protocols and her years of experience in a manner where it could be put to practical utility.

11. Jyotsna Suri

Dr Jyotsna Suri is working in the field of obstetrics and gynaecology for the last 27 years. She is presently professor in the dept of obstetrics and gynaecology at VMMC, New Delhi. She is MBBS from LHMC in 1988 and MD Obstetrics and Gynaecology from Safdarjang Hospital in 1993. Her main area of interest is high risk pregnancy and critical care obstetrics and endocrinology. She has many awards to her name like WHO fellowship in reproductive endocrinology and APJ Abdul Kalam award for 2020 by Delhi Obstetrics and Gynaecologist Forum. She has edited and authored two books, namely *Practical Approach to Critical Care in Obstetrics* published by Jaypee Publishers in 2018 and another one is *Abnormal Placentation* published by Jaypee Publishers in 2020 [27].

12. Dr. Asmita Muthal-Rathore

Maternal foetal medicine is a challenging field in obstetrics and gynaecology. Dr Asmita who is Director, Professor and Head of obstetrics and gynaecology, MAMC, New Delhi, has worked immensely in this field. She has written 3 textbooks, namely *Hormones in Obstetrics and Gynaecology* (FOGSI), *Common Clinical Problems in Obstetrics and Gynaecology: A Practical Approach* and *Case discussions in Obstetrics and Gynaecology*. Along with textbooks, she has numerous publications in national and international journals.

13. Dr. Pikee Saxena

Dr Pikee is presently working as Professor of obstetrics and gynaecology at LHMC, New Delhi. She has been awarded with 28 gold medals for her research presentations in national and international conferences. She has authored two books- *Clinical Guide for Management of Diabetes in Pregnancy* and *Postpartum Haemorrhage* which is also co-authored by Dr Aruna Nigam.

h) Ophthalmology

Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi is considered as one of the premier institute for eye diseases and has produced many prominent ophthalmologist.

1. Dr. Ramanjit Sihota and Dr Radhika Tandon

Dr Ramanjit Sihota has done MBBS from CMC, Velloreand MD Ophthalmology from AIIMS, New Delhi. She is presently Head of glaucoma research facility and services at Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS. She has 197 publications in peer reviewed international journals, 3 books and 24 chapters in her name. Prof Sihota was instrumental in initiation of a National Task force for glaucoma through the Ministry of Health and Family Welfare, India, that developed a comprehensive Action Plan for treatment and prevention of blindness due to Glaucoma in India.

Dr Radhika Tandon is MBBS and MD ophthalmology from AIIMS, New Delhi. She is presently Professor of ophthalmology at Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi. Dr Radhika has received various awards like President of India' s Silver medal for highest marks nationally among female medical graduates 1986, Muthusamy Gold medal Royal College of Surgeons Edinburgh for highest marks in Ophthalmology 1992. She has served the post of President of Eye Bank Association of India 2016-2018.

Dr Ramanjit and Dr Radhika have edited a famous textbook in ophthalmology by the name *Parsons Diseases of the Eye* (19th to 23rd Editions), published by Elseiver[28]. They wrote this book because of the urgent need for a book on eye diseases as seen in India, which differs greatly from the western view of the diseases.

2. Dr. Kirti Singh

Dr Kirti Singh is graduate from LHMC, New Delhi in 1986 and postgraduate from AIIMS, New Delhi in 1989. She is presently Professor in the Department of ophthalmology at MAMC, New Delhi. She has done various fellowships in glaucoma from UK and USA. She has also received Commonwealth fellowship from London in 2000 and WHO fellowship in 2009 for low vision rehabilitation. She has written two textbooks- *Contact Lenses Principles and Practice* published by

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CBS publisher in 2017. She wrote this book because of lack of needed information on contact lenses. Second book is *Step by Step Glaucoma Surgery*, published by All India Ophthalmic Society. Besides writing textbooks of ophthalmology, she also writes English poems.

3. Dr. M Vanathi

Dr Vanathi is MD in ophthalmology from AIIMS, New Delhi. She is presently working as professor of ophthalmology and cornea specialist at Dr Rajendra Prasad centre, AIIMS, New Delhi. She has written 2 textbooks- *Postgraduate Ophthalmology and Undergraduate Ophthalmology* [29]. She has more than 100 publications in indexed journals and over 35 chapters in international books.

4. Dr. Zia Chaudhuri

Dr Zia Is Director Professor of ophthalmology at LHMC, New Delhi. She has written a book named *Postgraduate Ophthalmology* published by Jaypee Medical Publishers. This book has 2 editions, the first edition came in 2012 and the second one came in 2020. This book is a comprehensive and holistic textbook customised to the postgraduate curriculum in ophthalmology in India. In addition, it has a global perspective with contributions from many national and international stalwarts in ophthalmology. It is useful as a text cum reference book for ophthalmic fellows. Dr Zia has more than 250 publications, she has been editor of 5 books and written 98 chapters in various books.

i) Otorhinolaryngology

Over the last 30 years the specialty of Otorhinolaryngology has undergone dramatic development and has taken advantage of new advances in endoscopy, microsurgery, the use of lasers and flap reconstruction.

Dr. Shruti Dhingra

Dr Shruti Dhingra is alumni of MAMC, New Delhi and PGIMER, Chandigarh. She is presently working as Head of the department of otolaryngology and head and neck surgery at ESIC Medical College and Hospital, Faridabad. She went for advanced training in laryngology at Massachusetts Eye and Ear Infirmary, USA. She is the co-author of the famous textbook by the name *Diseases of Ear, Nose and Throat and Head and Neck Surgery.* This book is currently in 7th edition and published by Elsevier [30].This book was first published in 1992 and is widely considered as a standard textbook by medical students. Dr Shruti is also co-author of the *Manual of Clinical Cases in Ear, Nose and Throat* which is also published by Elsevier.

j) Dermatology

The skin is an incredible organ. It is our first line of defense against diseases. Dermatologists have the unique skills to offer the best care for the organ that cares for us.

Dr Neena Khanna

Dr Neena Khanna is MBBS (1978) and MD in dermatology from AIIMS, New Delhi in 1984. She is currently working as Professor at AIIMS, New Delhi. She has written a textbook -*Synopsis of Dermatology and Sexually Transmitted Diseases,* 6th edition [31]. She has received various awards and achievements with over 25 chapters in books and over 150 articles in journals.

k) Anaesthesia

Anaesthesia derived from the Greek word "without sensation" is a state of controlled, temporary loss of sensation or awareness that is induced for medical purposes.

Dr. Usha Kiran

Dr Usha has worked as Professor and Head of the department of cardiac anaesthesia at AIIMS, New Delhi. She has been practising cardiac anaesthesia and intensive care for more than 35 years. She is the chief editor of the *Textbook of Vascular Anaesthesia.* Besides this she has more than 280 publications in peer reviewed journals. Lifetime achievement award has been conferred to her by the President of India in 2010. She has special interest in teaching stress management to patients who are undergoing heart and vascular surgery.

V. Conclusion

This article gives a synopsis of 40 women stalwarts who have worked towards the upliftment of medical education of our country. There may be many more who have contributed their roles in their respective fields. Writing one article takes few weeks to few months, whereas writing a whole book can take months and years to complete. A reader while reading the book may not acknowledge the tremendous efforts put in by the author, therefore it was very necessary that through this article the readers get an insight of the hard work put in by the writers and especially women who plays multidimensional role in the society. A 34.3 km crater on Venus named *Joshee* in the honour of Anandibai Joshi is a proof of such recognition of women [32].Women education is the most powerful tool to bring a positive change in any society. Talented women of such calibre need no escalator or support from others, rather they stand as pathfinders and role models for many futuristic generations to come. Contributions of these empowered women should be documented and recognised more often in literature so that more and more younger women get to know them.

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Table 1: List of women authors with popular textbooks

Subject	Women Authors	Popular Books
Anatomy	Dr. Krishna Garg	Textbook of Histology
	Dr.Neeta Kulkarni	Clinical Anatomy: A Problem Solving Approach
	Dr. Rani Kumar	Textbook of Human Embryology
	Dr. Veena Bharioke	Textbook of Human Histology
	Dr. Subhadra Devi Velichety	Inderbir Singh's Human Embryology
	Dr. Mrudula Chandrupatla	Concise Anatomy
	Dr. Daksha Prashant Dixit	Textbook of Human Embryology for Undergraduate and Postgraduate Students
	Dr. Renu Chauhan	Essentials of Genetics
Physiology	Dr. Surrinder Himmat Singh	Principles of Human Physiology Courses in Nurses and Allied Health Sciences
	D. Indu Khurana	Textbook of Medical Physiology
Biochemistry	Dr. Sreekumari S	Textbook of Biochemistry for Medical Students
	Dr. Veena Singh Ghalaut	Manual of Biochemistry for MBBS
	Dr. Poonam Agrawal	Concepts in Biochemistry with Clinical Approach for Undergraduate Medical Students
Pathology	Dr. Chitra Sarkar	Essentials of Diagnostic Surgical Neuropathology
	Dr. Sunita Sharma	Concise Haematology
	Dr. Vandana Puri	Complete review of Pathology and Haematology for NBE
	Dr. Ila Tyagi	Essentials of Gross Pathology
Microbiology	Dr. Seema Sood	Microbiology for Nurses
Pharmacology	Dr. Padmaja Udaykumar	Medical Pharmacology for Medical Students
Obstetrics and Gynaecology	Dr. VG Padubidri	Shaw's Textbook of Obstetrics and Gynaecology
	Dr. SS Trivedi	Management of High Risk Pregnancy, A Practical Approach
	Dr. Sudha Salhan	Textbook of Obstetrics and Gynaecology
	Dr. Suneeta Mittal	Obstetrics and Gynaecology, The 5 Minute Consult 2020
	Dr. Shakuntala Baliga	Textbook of Colposcopy
	Dr. Neerja Goel	Step-by-step Non Descent Vaginal Hysterectomy
	Dr. Mala Arora	First Trimester in Pregnancy
	Dr. Pratima Mittal	Practical Approach to Critical Care Obstetrics
	Dr. Manju Puri	Clinical Methods in Obstetrics and Gynaecology
	Dr. Surveen Ghumman	Step-by-Step Ovulation Induction
	Dr. Jyotsna Suri	FOGSI Focus: Abnormal Placentation
	Dr. Asmita Rathore	Hormones in Obstetrics and Gynaecology (FOGSI)
	Dr. Pikee Saxena	Clinical Guide for Management of Diabetes in Pregnancy and Postpartum Haemorrhage

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Ophthalmology	Dr. Ramanjit Sihota and Dr. Radhika Tandon	Parson's Diseases of the Eye
	Dr. Kirti Singh	Contact Lenses: Principle and Practice
	Dr. M Vanathi	Undergraduate Ophthalmology
	Dr. Zia Chaudhuri	Postgraduate Ophthalmology
Ear, Nose & Throat	Dr. Shruti Dhingra	Diseases of Ear, Nose and Throat & Head and Neck Surgery
Dermatology	Dr. Neena Khanna	Synopsis of Dermatology and Sexually Transmitted Diseases
Anaesthesia	Dr. Usha Kiran	Textbook of Vascular Anaesthesia

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