Chapter III.

RESEARCH METHODOLOGY

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Chapter III.

RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes the details of the selection of topic, relevance of the study, definitions, objectives, assumptions, sources of data, universe and sampling, inclusion and exclusion criteria, limitations and the methods of processing of data. The details of presentation of materials and the formats are also discussed.

This is a multisectoral, interdisciplinary study involving areas of health, medicine, social behaviour, human psychology, administration, economics and development concepts. The faculties covered are of two types. The faculty of Medicine dealing with technical issues on a purely quantitative basis and the faculty of social sciences where the qualitative component is given equal prominence if not more.

As this is a new disease, many of the issues are still in the formative phase and the study pattern had to be changed at times to suit the convenience of the subjects. One concern was confidentiality of the subjects and therefore the researcher has chosen an approach slightly different from the conventional study patterns. The changes in the population under study and that of the state at large is a
difficult one to study and interpret, especially considering the peculiarities of this illness, which is not an openly discussed issue in many contexts.

3.2. Statement of the research problem.

The state of Kerala has been in the forefront of many issues concerning health and education. Any incident in Kerala attracts lot of public attention from inside and outside the state. With the discovery of the HIV epidemic in western world, our state, like our country has been on a stage of denial. This denial took many forms from the administrators, society, households and individuals. The major thrust in this denial was the concept that ‘it is not our problem, but somebody else’s’. However the society was pushed into the scene with the increasing number of individuals and households becoming affected. There were more problems that sprang up than what could be envisaged from any previous experience.

The usual approaches to illnesses centre around patient, care taker, health institution and drugs. There has been pre civilization approaches tackling disease as a curse. But this study looks at a different angle of health of the society.
In spite of the enviable developments in many areas of human life quality, Kerala is facing lot of problems in handling the situation. In spite of many lessons learnt from many parts of the globe, we are not able to offer the best solutions for the various issues involved. The reasons are not obvious. An effort is needed here to unscramble this puzzle.

The present study was planned to enlist some of these problems and to identify the attempts at solution(s) for the many ills associated with this. The response of this educated society has to be recorded now. This study is undertaken to document the pattern and outcomes of the illness as it strikes this state and the responses and likely reasons behind them.

3.3. Objectives of the study

This study aims at identifying the social and medical issues related to HIV AIDS, particularly focusing on the problems faced by the identified patients entering the medical stream in Kerala. The family, relatives and friends are also included with an intention to better the health of the society as a whole rather than treating this as the problem of a few individuals.
Thus the objectives are listed as

1. To map the socio demographic profile of the disease in Kerala.
2. To identify and enlist the problems faced by PLWHAs and their relatives in the hospitals, family, community and workplace.
3. To enlist the forms of stigma and discrimination in our state.
4. To consolidate the existing response patterns from society.
5. To identify the changes happening, with the introduction of better care.
6. To propose remedial measures for a better approach

These objectives are to be achieved in the Kerala context with the infected persons (PLWHAs) as the centre point and the various functionaries of the state, society, community, work place, family and health institutions around them.

The importance of the field of education is recognised and the remedial measures are expected to incorporate the latest developments and lessons from various parts of the globe.

3.4. Relevance

Lots of unanswered questions remain in the field of HIV / AIDS. There is serious discordance in the literature on the actuality of the seriousness. Is the mortality associated with HIV on a serious
scale, as an epidemiological and public health or social issue? How
does it compare with other regional or global causes of illness and
death? What kinds of impacts it can have apart from being a medical
problem? World Health Organisation, the global apex body has
apparently confusing figures. Who reports regarding AIDS deaths is
mostly clear, whereas the ‘projected’ infection rates and figures raise
serious doubts. The number of recorded AIDS deaths is still low. But
the change in the morbidity of young adults as a result of the
occurrence of HIV infection is alarming. In almost all other diseases
morbidity and mortality affects a population – the aged and the very
young – where the rates are already high. Finally, for many reasons,
ilness and particularly deaths directly resulting from infection with
HIV are not recognised, let alone reported. The actual cause of death
usually is an identifiable communicable disease, pneumonia,
tuberculosis, diarrheal diseases etc… In many countries where the
presence of HIV is not directly recognised, or admitted there had
been reports of increase in Tuberculosis cases. The tendency by the
infected and health provider to keep the status confidential adds to
the confusion.
It has been argued that the focus on HIV / AIDS epidemic is diverting attention from other health problems, many of them more serious. This argument may initially sound valid for a country like India where infectious diseases are still a major cause of morbidity and mortality. However there are certain unique features for this epidemic.

* **Extended and very high treatment costs**, which run into many months, many conditions, many drugs. The treatments are expensive but of doubtful effects on the ultimate survival.

* **The likelihood of multiple cases of HIV / AIDS in the same family**. Primary route of infection now is between husband and wife and children.

* **Death is preceded by a long period of illness**, leading to a prolonged period of unhealthy life, requiring a lot from family, community and support systems.

* **Long asymptomatic period** leading to a negative impact on the morale of those infected, and during which time the person unknowingly is transmitting infection to others.
* **Productive years** of the young adults are affected, leading to unimaginable effect on demography, economy and social organisations.

* **Private decisions.** Unlike many other diseases, HIV / AIDS is largely the result of private decisions and impinge upon a person's human instincts. This also means that most prevention policies can at best be indicative, but difficult to be enforced.

* **High levels of stigma and discrimination** are associated with the disease.

The ability of any society to cope with a newly emerging problem depends on many variables. These include previous history of the social adaptability, economic and educational status and extent of involvement by various members. This also depends a lot on the state of the art technologies, science and educational status of the institutions. Advocacy and involvement of public health practitioners contribute a lot into the final picture emerging. There is substantial literature that provides for guidelines in identifying priorities in public health and for the introduction of measures that are likely to benefit the health of communities. Further there are numerous decision making and planning models that can be applied to specific public
health scenarios. However there is paucity of literature that guides public health advocates as to when and how to undertake an advocacy campaign for a special issue. Attempts to make decision making models have been met with varying effect.

Decision making in public health is a complex and dynamic process, that is influenced by science, epidemiology, social, cultural, economic and political factors. In public health and medical social work, there exists a precedence and mandate for the community to be protected from behaviour that may cause harm to either the individual or others. In curative medicine the principles of beneficence and autonomy are less likely to come into conflict due to the presence of illness. However in public health there may be no symptoms, the disease may have an aspect that is self induced, the solutions may be coercive, could involve social justice strategies that are redistributive and the possibility of disease may be well away with no absolute evidence that every individual will be affected. Indeed there will always be some that will not develop the illness or problem. Proposed interventions may have different ethical considerations and need to be weighed against the size and severity of the problem.
The Indian and Kerala approach to HIV AIDS has been one of complacence. In spite of the fact that all media were putting forth warnings again and again, the nation as a whole and the state has been underplaying the issues. In a small state like that of Kerala, where social and family norms are definitely more uniform than in many societies, the responses to this epidemic should have been much more scientific and could well have been more on lines of adaptability and role modeling. Whether Kerala needs costly interventions is something which should be studied. The efficacy of interventions is to be examined in relation to benefits and costs. It should be possible to decide whether the potential benefits of any policy or intervention are greater than costs. If benefits are greater, then the decision making can be may be taken to next stage, where an assessment is made of the level of acceptance. If the benefits are less, then it is suggested that the proposed act be discontinued. If the answer is unclear, then it might be appropriate to advocate for a pilot testing or trial of the proposed measure.

According to reports only about 0.7 percent of the population is affected now. That means 99.3 percent are free of the disease, in spite of the fact this epidemic has crossed two decades. This offers us
a good chance of protecting the great majority of normal persons in
the society. The essential pre requisite for this is a proper
understanding of the current situation. It may be recalled at this stage
that the spread of this disease depends to a large extent, on the
behavioural patterns of the persons who have the infection, as they
are the persons who transmit the infection to others, knowingly or
unknowingly. Their behaviour is moulded to a great extent, by the
responses of various components of the society.

Thus it is considered that this is an appropriate time in the
epidemic cycle for us to look into what’s happening and what is
lacking. This will help us plan where to go next with which
interventions.

3.5. Major Assumptions

As this study is a long term one, it was necessary to define the major
assumptions as follows. Some of these are subjective and hence
cannot be verified with variables. However as much as possible,
quantitation of data must support these assumptions.

a) In spite of a very good model of education, literacy &
awareness, Kerala’s behaviour towards this epidemic is not
appropriate. This can be overcome, if proper orientation,
training and media orientation can be ensured. With better information transfer and changes in attitudes and practices, it would be possible to make this epidemic decelerate and reduce the deleterious effects on the life of the affected person.

b) Absence of treatment was a major obstacle in the social acceptance of the disease and once that barrier is lightened, care and survival of HIV infected persons and attitudes can improve.

c) Responses to HIV infected persons and the survival pattern of HIV infected persons are strongly influenced by the attitudes of health care staff and there are lots of lacunae in this field.

The clinical pattern of the disease can be modified with proper therapy being given at the right time.

3.6. Definitions:

Most terms used in the study are self explainable. However certain words need clarification. They are given abstract definitions for the purpose of this discussion.

HIV infection: For the purpose of defining the illness, there are many definitions available. But the definition of infection is rather precise. Any person found to have at least three tests for HIV
antibody positive is considered as HIV infected. Where the person
has overt manifestations of AIDS, two tests are considered sufficient.
As there are many different varieties of tests available, the tests were
chosen depending on the location of the patient, access to the
laboratory and the willingness of the patient to choose the laboratory
which will suit the confidentiality requirements of the patient as well.

(Western blot tests were considered mandatory at certain
stages, but the current National HIV testing policy does not insist on
this, in line with the World Health Organisation recommendations¹.
Also considering the facts that Western blot test is not available in
government sector in Kerala outside Thiruvananthapuram district
and that it involves an expense of Rs.1500/= per test, it was not
considered mandatory in the study patients.)

AIDS: Various case definitions are available for AIDS case
diagnosis. However considering the field realities, modified Indian
case definition (NACO) is the one that has been used for the purpose
of this study.

The clinical case definition given by WHO is as follows.
“AIDS in an adult is defined by the existence of at least two of the
major signs associated with at least two major signs associated with at
least one minor sign in the absence of known causes of immunosuppression.”

**Major signs**

1. Fever of one month duration (unexplainable)
2. Diarrhoea of one month duration
3. Weight loss of more than 10% (recent, unexplained)

**Minor signs**

a) Persistent Cough of more than one month’s duration

b) Unexplained itching due to Generalised pruritic dermatitis

c) Recurrent Herpes Zoster

d) Oropharyngeal candidiasis

e) Chronic progressive and disseminated herpes simplex infection

f) Generalised lymphadenopathy

Even though this was a very good definition, the problem of over diagnosis was very much. The modified Indian case definition National AIDS Control Organisation, (NACO), Govt. of India is as follows.
“AIDS in an adult is defined as one who has positive test for HIV antibody detected by two separate tests using two different antigens AND any one of the following”

1. (a) weight loss of more than 10% body weight or cachexia
   (b) chronic diarrhea of more than one month’s duration
   OR chronic cough of more than one month’s duration

2. Disseminated miliary or extra pulmonary tuberculosis

3. Neurologic impairment restricting daily activities (not known to be due to a condition unrelated to infection)

4. Candidiasis of the Esophagus diagnosed as Painful dysphagia along with oral candidiasis

5. Kaposi’s sarcoma

**HIV / AIDS:** This is a term which is used to refer to the common issues applicable to both HIV infected asymptomatic person and AIDS patient.

**PLWHA:** This is the term accepted now across the world to refer to HIV infected person at any stage.

**Family:** Even though there many definitions available, for the purpose of the study, family was considered to include the spouse and kids in the case of married / divorced / separated persons and
the parents comprising of father and mother and siblings (brothers and sisters).

In the case of unmarried persons (including children), the family was considered to include the parents comprising of father and mother and siblings (brothers and sisters).

**Relatives:** For the purposes of the study, any person related by blood or marital relations within the expanded family excluding those in the previous definition were counted as relatives.

**Friends:** This group was defined rather loosely. Any person who was interested in the affected person or his issues was accepted as a friend. He need not always be acting in the best interest of the PLWHA. This included class mates, co workers, other members of the society like teachers, local leaders and in some cases religious leaders.

**Workplace:** Any place where the person has been attending work or study prior to his being identified. This exclude places where he has been relocated after his HIV status became known.

**Health care provider:** This is a term frequently referred in the study. This includes the doctors, nurses, paramedical personnel, field health workers, counselors and members of the drug delivery systems.
**KABP:** is the acronym for Knowledge, Attitudes, Beliefs and Practice and refers to existing or attempted changes in relation to any behaviour change study.

**Stigma and Discrimination:** Stigma is a dynamic process of devaluation, whose qualities are quite arbitrary, arising from the perception that there has been a violation of a shared set of shared attitudes, beliefs or values.

Discrimination is an action that occurs when a distinction is made against a person. This results in his or her being treated unfairly and unjustly, on the basis of their belonging to a particular group.

### 3.7 Sources and methods of data collection

The study was conducted in Kerala from 1996 to 2003. The major part of materials had been collected by the candidate himself during his work as a clinician trainer on AIDS in Kerala and various other states. Because of the fact that his centre has been acting as a referral centre, patients from the length and breadth of this state are being referred to him.

A combination of quantitative and qualitative methods are being used.
As this is an analytic and descriptive study, various methodologies have been incorporated. Of prime importance is the fact that this study describes the social aspects of an illness to talk about which is not clearly comfortable or pleasing for many or anyone involved. It is to be noted that all ethical, social and psychological issues center around concepts of confidentiality. As the study has derived lot of materials from direct interactions with concerned individuals, it was imperative for the study design to respect the rights of individuals concerned. This was particularly important in a state like Kerala where the people are conscious of their rights and civil liberties. Therefore, the researcher has been forced to omit out many direct references to person and place names in many contexts. This is particularly relevant in the chapters on observations and analysis and case studies. Even though this limits the description of characters, suitable proxy names are used in almost all situations.

The data was collected from primary sources described below.

1. Patient details available in Medical College Hospital, Gandhinagar, Kottayam. Both out patients and in patients attending various departments have been included.
2. Published information from the Kerala state AIDS Control Society (Dept. of Health, Govt. of Kerala) National AIDS Control Society (Ministry of Health & Family Welfare, Govt. of India) and the Joint United Nations Program on AIDS (UNAIDS), the erstwhile Global Program on AIDS and World Health Organisation.

3. The interactions with various projects at Tata Institute of Social Sciences, Mumbai, National Institute of Mental Health & Neurosciences, Bangalore, National Institute of Virology, Pune, National Institute of Communicable Diseases, NewDelhi.

4. During the visits of the researcher to major institutions abroad, significant inputs have been received. Thailand Institute of Public Health, Bangkok; Japanese Foundation for AIDS Prevention, Tokyo; Parirenyatwa Hospital, Beatrice Road Infectious Disease Hospital, Wilkins Hospital for Infectious Diseases, Harare Hospital, Chinyoyi Hospital, St.Pauls Musami Hospital and AIDS Counselling Trust of Zimbabwe; Central Hospital in Nairobi, Kenya and many
WHO/UNAIDS institutions in Geneva also contributed many subjective and objective views on various issues.

5. The published materials from the media. Local, national and international dailies and periodicals were relied upon to get the views of the lay public. Some of them are exhibited as Annexure III. The internet forums including mailing groups and bulletin boards of AIDS INDIA, SAATHI and various websites had helped with many general and individualised discussion materials.

6. Data was collected regarding knowledge, attitudes and practices of general public, college students, college lecturers, nurses, hospital staff, medical students, and medical practitioners. The materials were collected during the 117 orientation programs delivered to these categories in various parts of Kerala in the eight years under study. Comparisons are made between responses in the first and last four years.

3.8 Methods and Tools of data collection: Two main methods were used during the research:

1. Interviews and discussions.

2. Questionnaires.
The first category comprised of key informant interviews, in-depth individual interviews, and focus group discussions. Direct interviews were conducted with all patients in the study. This was done either as part of the routine counseling procedures prior to and after the laboratory testing, during clinical care of infected persons or as specific interviews for the purpose of eliciting context specific information.

Interviews with the spouses, family members, relatives, friends and members of the community have been also used as a very important indicator particularly in the social analysis of responses.

Questionnaire method was used to analyse the responses from the student and academic community.

3.9. **Universe and Sampling.**

The study was intended to cover the state of Kerala. As such this was a part of the whole country of India and the world at large, as HIV/ AIDS and its responses are parts of a worldwide phenomenon. For the purpose of the study, the universe was the total number of HIV infected population and the Kerala society at large.

However, for the purpose of the study, it was not possible to include all patients in all hospitals for obvious reasons of practicality.
It may be noted that in Kerala during the period of this study, most public and private hospitals were not accepting HIV patients for various reasons. Most patients were treated and followed up in medical colleges in govt. sector only. Amongst the six medical colleges that existed at the beginning of the study period, all others were sending most patients to this hospital, considering the expertise available here. A large number of patients from other medical college hospitals too found the non discriminating environment in Kottayam Medical College acceptable at large. Besides, as stated earlier, the researcher had the chance to see majority of patients at one time or another, as he was a state level technical consultant and was visiting a large number of institutions where cases are being managed and a good number of them have ultimately been followed by the researcher himself.

Considering these factors, random sampling was not done. Any form of random sampling would have spread the cases to many places. This would have interfered with the personalized discussions and repeated follow up that was very important in any analysis of this sort. The various forms of interactions and data collection like focus group discussions and special interactive sessions could be arranged
only in places with a suitable environment. It may also be noted that because patient's individual responses are also important in such a study, all consecutive patients (as in a census method) was chosen. The impression was that the sum total of observations would represent the universe of all HIV infected persons in Kerala. This may be accepted as convenient sampling.

3.9.1. Inclusion and exclusion criteria for cases. HIV infection and AIDS was diagnosed as per the definitions quoted above. All those who qualified these definitions were included. During the period from 1996 to 2003, 1585 cases were seen by the researcher.

Thirty five cases where the patient died before any concrete response could be elicited. They were not taken into the analysis. Remaining 1550 cases were included in the study. Thus 1550 HIV infected persons seen by the researcher during a period of eight years from January 1996 to December 2003 formed the major sample for the study. In cases where spouses have been included, they were seen as separate entries. The same was done for children too. Of the 1072 AIDS cases studied, 102(9.5%) had died during the course of study. Five PLWHAs committed suicide. One person died in a road traffic
accident and one person died of chronic renal failure which was unrelated.

All the 1550 were analysed for their clinical patterns, responses to the illness, attitudes and behaviours as well as stigma and discrimination related information. However the family and friends’ responses could be documented only for 1128 cases, as they were not available for eliciting information in spite of repeated enquiries and soliciting. These samples were asked to report thrice in the first month after detection, and monthly thereafter. Where there has been no significant event, they were asked to report once in an year or whenever they developed some problems. In case of death of the person, one family member was asked to report in person within one month to record their experiences and response. The responses were reviewed and necessary counseling offered by a qualified counselor during most part of the study. However due to the counselor not in station for the last two years of the study, the researcher himself is attending these services. The clinical features with which these persons have presented are also being analysed.

The second population that was studied was that of the spouses, relatives and friends, as defined earlier. Of the 997 married
persons, 822 turned up for the discussions and 69 were irregular and hence their responses were excluded. 106 spouses did not turn up for evaluation and discussion at all. It was not possible in all instances to force the PLWHA to come with the spouse for social, emotional and economic reasons. It was also considered as the individual’s decision was the supreme in relation to any decision about involving others in care and support, particularly when it involved the revelation of serostatus.

The next group that was studied was the health care professionals. Here again, convenient sampling was used. As there was a compulsory training program conducted in the campus for Biomedical waste management involving all hospital staff, they were submitted to the questionnaire method of data collection regarding their attitudes and practices. 1800 responses were received as part of the routine feedback and these were compared before and after the session on HIV/AIDS in the workplace and hospital safety.

A sample of 68 nurses and 261 paramedical staff posted to the Infectious Diseases Unit caring for HIV infected persons as well as other parts of the hospital like the labour room, casualty and operation theatre where PLWHAs are being cared, were studied using...
focus group discussions and direct interviews on different occasions. Their observations and experiences have added a lot to the qualitative component of the study.

Every year two hundred and eighty students join the various courses conducted in the campus of Kottayam Medical College. This includes 100 MBBS students, 40 B.Sc. Nursing students, 40 students for various paramedical courses. Besides eighty post-graduate students who join every year are also included. Thus in the eight years of study, about 2000 students were given a chance to express their emotions on issues related to HIV care. However the total number of responses analysed could be only 1494, as there was a large number of defaulters. All those who offered these responses are personnels in the profession and hence their responses regarding willingness for care are being analysed.

A group of college teachers and NSS volunteers from the erstwhile PreDegree classes and later the plus two classes in Kerala who attended the 117 orientation programs delivered to these categories in various parts of Kerala has been systematically assessed in the eight years under study. The researcher had a chance to be associated with these programs, as he has been serving as a resource
person for this category of IEC (Information, Education and Communication) programs. 120 college teachers and 2286 students responded during the many programs organized at places of their convenience. Using the materials collected, comparisons have been made between the responses in the first and last four years. This is also a form of convenient sampling.

As part of the counseling the researcher had a chance to interact with many members of the lay public. In total 3274 responses were recorded during these eight years and this category included HIV negatives coming for counseling (1366), local leaders and opinion makers (543), members of the press (87), patients and relatives with other illnesses (1278). Considering the variety of responses, it was decided that all of them will be included as in a census method of study.

3.10 Data processing and Presentation

All the data being collected was entered into computer using Microsoft Excel and Microsoft Word programs utilizing the inbuilt facilities in those softwares. Statistical work was also done using the Microsoft Excel software.
Descriptive and analytical methods are used for data presentation. The chapter on Observations and Analysis (Chapter VIII) depicts the findings. The data is being presented in three ways:

1. Objective data (Demographic Clinical and Response patterns) is being presented with tables, histograms, pie charts.

2. Subjective (Actual responses with emotional components highlighted)

3. Case studies (Representative from different contexts) are presented in Chapter VII.

4. Material pertaining to media reports and population studies concerning different fields are presented as picture sheets and charts in the chapter on Kerala Scenario (Chapter V).

3.11 Limitations of the study

As has been stated in the chapter on Introduction (Chapter I), this disease presents many unique problems.

The issue of confidentiality and the fact that individual rights are to be respected, has put the researcher in a difficult position in many instances, particularly when it comes to revealing the identity and quoting many persons by name.
As the sample selected is a convenient sample, which is mostly a facility (service provider) based, it is likely that this may not represent the real universe, which is not clearly visible also, as of now. This fact has also influenced the lack of availability of accurate information even from ‘authentic’ sources and questions are raised about the accuracy of information. \(^{3,4,5}\)

As the researcher is less experienced to handle emotional crisis and social issues compared to his clinical experience, it is likely that some of the responses would have been over expressed or suppressed. Subjects also would have emotionally linked their responses to the quality of care they desire and this might have induced some bias into the study.

Regarding the component contributed by the uninfected groups (public, health staff, teachers and students) the possibility of a false generation of data cannot be excluded, as the researcher happened to be one identified as an advocate of PLWHAs. This would have prompted many to mark more acceptable answers to the questions rather than what is the true reflection of their mind. There is also the limitation that most of these groups are likely to be constituted by people who are inclined to think along the same lines
as that of the organizers of such programmes. The diffidents would not have turned up for many such programs.

Lack of relevant literature pertaining to the HIV/ AIDS India and Kerala was a major limitation. There were few studies available, but mostly from the field of Awareness assessment and Knowledge Attitudes Behaviour arena. However whatever information was available was assimilated.

The comparison of data between the respondents in the first and second half was done to know the differences (if any) as a result of various interventions and improvement in general awareness. However it is clarified that these were neither the same subjects nor were they matched by age, sex or educational status. However the comparison is done because the level of education viz. PreDegree class was common. There is also no reason to think that the college lecturers’ answering pattern would be different.

Finally even though attempts have been made to include all levels of people (economic, educational, social, geographic and occupational), the samples selected may not include all components of the universe intended to be studied and therefore some of the conclusions may be false generalizations.
3.12 Chapter scheme and References.

The material is presented as per the following chapter plan.

I. Introduction – Social aspects of Medicine
II. The Past, Present & The Challenge in HIV scenario
III. Research Methodology
IV. Review of Literature
V. Kerala Scenario of HIV/AIDS
VI. Biological / Medical aspects of HIV Disease
VII. Case Studies
VIII. Observation & Analysis
IX. Conclusions & Recommendations.

Referencing style: *The Vancouver style* of citation and reporting is adopted throughout the presentation for citation, references and Bibliography. The details regarding this style has been adopted from the recommendations of the International Committee of Medical Journal Editors.(Uniform Requirements for Manuscripts Submitted to Biomedical Journals)\(^6\). References have been kept to the end of each chapter with the articles cited with superscripted numbers as they are referred and not in alphabetical order. An exhaustive bibliography (in alphabetic order) has been appended at the end.
References:


