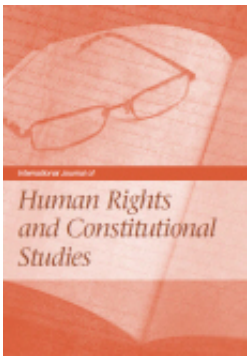

International Journal of Human Rights and Constitutional Studies

ISSN online: 2050-1048 - ISSN print: 2050-103X
https://www.inderscience.com/ijhrcs

Prevailing gender inequality in clinical trials: a blow to health rights of women

Monika Punia, Maryam Ishrat Beg

DOI: 10.1504/IJHRCS.2022.10051819

Article History:
Received: 04 August 2022
Accepted: 19 September 2022
Published online: 04 April 2024

Prevailing gender inequality in clinical trials: a blow to health rights of women

Monika Punia*

School of Law,
Manipal University Jaipur,
Rajasthan, India
and
Manipal Law School,
Manipal Academy of Higher Education, India
Email: monikapunia94@gmail.com
*Corresponding author

Maryam Ishrat Beg

School of Law,
Manipal University Jaipur,
Rajasthan, India
Email: Maryam.pari75@gmail.com

Abstract: Gender inequality does persist in many crucial areas of society and health is one of them. Due to the underrepresentation of women in clinical trials, an entire gender is suffering a fatal blow on their right to health. With time, it has also been analysed that various diagnostic methods that were rendered ineffective in males were working efficiently for women, and vice versa. Ignorance of the health rights of women in the country is not just limited to impacting a gender in the society; however, it also hampers the economy, life expectancy, family support, health expenditure, etc., of a country. It is high time that the international instruments do focus on maintaining and updating healthcare structure equally for both genders and gender-specific studies are not to be considered valid in the further approval processes. Later similar changes could be brought to the domestic front as well.

Keywords: health; women; underrepresentation; clinical trials; gender inequality; healthcare; rights; treatment; diagnosis; law.

Reference to this paper should be made as follows: Punia, M. and Beg, M.I. (2024) 'Prevailing gender inequality in clinical trials: a blow to health rights of women', *Int. J. Human Rights and Constitutional Studies*, Vol. 11, No. 2, pp.117–129.

Biographical notes: Monika Punia is an avid researcher in the field of human rights. She has done her BALLB and LLM from one of the prestigious universities in India. She has more than four years of experience in teaching and research. Currently, she is pursuing her PhD from Manipal University Jaipur.

Maryam Ishrat Beg is the co-author and learned academician with more than 15 years of teaching and research experience. She had done her LLB, LLM and PhD and was honoured with gold medal in her post-graduation. She specialises in human rights and family law.

1 Introduction

Gender-specific underrepresentation in clinical trials is creating an obstacle in inventing healthcare measures suitable to a particular gender. The clinical data received after trials based majorly on one gender results in data gaps that could later impact the health of an underrepresented sect of people when drugs are approved for usage by the public (Healthcare-in-europe.com, 2022). Sometimes even this has been noticed that women and men react differently to different drugs and hence if this has been noticed by healthcare professionals involved in clinical trials then separate clinical trials are to be conducted for such drugs on different genders (Healthcare-in-europe.com, 2022). Different genes, metabolism, hormones, etc. in men and women do give separate results in some areas of research, and hence allowing drugs for public use based on clinical trials done on men will result in shackling the health of women. The use of drugs resulting from clinical trials having a gender data gap could worsen women's health conditions, resulting in a violation of their right to health. Since the right to health is interlinked with the basic right to life and hence breakage in the chain of rights is suffered by not paying attention to the maintenance of gender ratio during clinical trials and studying the impact of testing drugs on both genders separately.

The disparity in health rights could be amended by maintaining the gender ratio in clinical trials. Secondly, active participation of people in clinical trials could lead to more innovative therapies, treatments, and drugs and it could also bring health equity and scientific accuracy at the approval stage (Primeau, 2022). However, active participation from all sects is necessary to eliminate data gaps in clinical studies but that is not happening. Though lack of active participation in clinical trials is occurring mainly due to major loopholes in the clinical trial industry, treating participants as subjects and not paying much attention to their health and risk involved in the trials. Secondly, clinical trials are not regulated properly in many under-developed and developing countries, hence big pharma companies take advantage of the absence of law to engage participants in the trials by giving some financial benefits to them. Hence any person who is not in dire need of money will not risk their health by becoming part of clinical trials. Thirdly, a person would hesitate to become part of these trials since there is an absence of any insurance or policy for the participant in case of post-clinical trial adverse effects.

Though the only reason for the underrepresentation of women in the clinical trials is not a lack of active participation but the other clinical trials stakeholders themselves would not like to engage women in conducting their study due to extended liability in case of pregnant women and to avoid the chances of hampering reproduction capability of a woman. In any such unfortunate incident where a woman suffers a loss due to an experimental drug then pharma companies might have to pay extra compensation and hence generally the pharma companies and clinical trial institutes do avoid engagement of women in their studies. Lastly, the non-existence of any specific regulation to mandate equal representation of women in clinical trials lets pharma companies engage destitute persons suitable as per their needs. Even at the time of approval of the drugs, the

authorities do not check the impact of treatment or drug response on different genders (Primeau, 2022).

The article ahead would focus on the reasons stated by the healthcare professionals in not engaging women in all clinical trials. However, the underrepresentation of women in clinical trials does have a huge impact on their health rights and other related human rights. The research further would focus on the effect of health rights of women due to underrepresentation with the help of some major incidents that happened in the past. Lastly, the arguments in favour of equal representation of women in clinical trials would be weighed beside the arguments in against and a conclusion would be drawn to balance out the approach in the concerned matter.

2 Methodology for the paper

The collection of literature was done on the basis of identifying the material which could fit in a doctrinal method of research. Recent surveys and studies have been chosen to understand the reasons for the underrepresentation of women in clinical studies.

3 Reasons for exclusion of women from clinical trials

Pharmaceutical companies globally experienced exponential growth in the last century; many companies dominate the existing market though over the period it has been observed that many barriers have been put up by regulatory authorities to market a new drug. The entire procedure of drug development involves various phases of the clinical study. Firstly, animal trials are conducted, and the results obtained are thoroughly studied by the researchers. Though no attention is paid to gender-specific studies in animals as well. Then begins phase I of human trials, in which few volunteers participate, and they are selected as per the needs of the clinical researchers. The aim of the phase I trial is to measure the minimal safety of the drug. If the drug is approved as safe then trials proceed for phase II, where the aim is to determine the dosage of the drug. After completion of this comes phase III, which is tested on a larger number of participants to test the efficacy of the drug and the possible side effects [Oppenheim, (2016), p.396]. Phase IV is generally conducted to study the effect of drugs on the general population post-marketing.

Though in comparison to the times of the early 20th century the phases and filters have been increased manifold by the regulatory authorities to get an approval of a new drug. Universal standards have been maintained globally and at the domestic level as well countries implemented legislation to regulate the approval of new drugs to maintain the health standards of their citizens. Critical studies of the existing rules on the subject suggest that gender-specific clinical data is not collected at the site of clinical trials, which obstructs modification of existing literature on basis of gender response to different drugs, treatments, diagnosis techniques et cetera. It has been observed as per the studies that gender-specific clinical trials are very rare in developing and under-developed countries, however, in countries like the USA, the regulatory authorities are becoming more stringent and vigilant to assure maintenance of the gender ratio in all government-funded clinical trials (Mastroianni, 1998). Though the problem is overlooked

and not given much importance in countries like India. The underlying causes and reasons for ignoring the participation of females in clinical trials have also been stated by healthcare professionals. Such statements by professionals arises the curiosity to study the reasons in detail and to check the accuracy of the same. Some of the major reasons for the exclusion of women from clinical trials are as follows:

1 It has been observed from the status of clinical trials that females have been excluded from clinical trials due to the increased liability if the drugs used in trials affect the reproductivity of a woman of child-bearing age. Clinical trial researchers have been cautious and avoid pregnant women because of additional fetal liability in case of adverse effects of the drugs. As some experts present the entire situation of "women of childbearing age were long excluded because of concerns that drugs could harm fetuses, as occurred with the drug thalidomide that produced severe limb abnormalities and diethylstilbestrol that increased cancer risks in children exposed to the drug during gestation" (Healthline, 2022). The famous case of *The Sunday Times v. UK* (European Court of Human Rights, 1979–1980) decided by the European Court of Human Rights dealt with the matter of thalidomide drugs. Thalidomide drug testing is still considered the darkest horror mistake of clinical research in the history of clinical trials. The earlier usage of thalidomide was to use it as a sedative later it was being used to treat nausea and morning sickness in pregnant women; however, it was observed later that consumption of thalidomide is resulting in severe limb deformities in the offspring of these women [Oppenheim, (2016), p.397]. Due to this incident, US Food Drug and Administration (FDA) issued the guidelines in 1977 to prohibit women of reproductive age from participating in clinical trials in phase I and phase II trials. This led to a further decrease in the percentage of women participating in clinical trials.

2 Another reason which plays a major role for not including women in clinical studies is that due to biological differences between men and women, the efficacy and collected data might not be accurate in relation to the drug administered to women during trials. Women respond differently to drugs than men. Factors like hormonal differences play a crucial role, which could fluctuate due to the menstruation cycle, pregnancy, age, contraceptive methods, etc. (Healthline, 2022) So due to these instabilities in hormonal levels women are considered difficult to study and to observe the effects of drugs administered to them. So, to avoid inconsistencies in the data report generated after the completion of trials, researchers do avoid the involvement of female participants.

3 Increased tort liability in case of women due to the complex body and another risk involved is that children born to women involved in clinical trials could file cases for claiming compensation in case the drug administrated during phase I and phase II could show some adverse effect on them [Mastroianni, (1998), p.178]. Such apprehension does come up as a potential obstacle hampering advancements in the health sector specifically in relation to women; this could hamper the health of the society as a whole in the longer run [Mastroianni, (1998), p.179]. The claims made by children born to women who participated in clinical trials have been more successful if history is analysed. The reason seen by courts while evaluating such cases is that in the case of pregnant women, the foetus is unable to give consent and in the case of women of reproductive age the entire scenario is very unpredictable.

The pharma companies or clinical trial sponsors do fear to include pregnant women and women of child-bearing age due to fear of liability of their offspring in the future [Mastroianni, (1998), p.181]. As the courts in different countries do not have a settled and firm opinion on this point and hence sponsors do not want to get under an apprehension of an extra burden by including female participants in their research. No change in this attitude is expected unless a strict rule is to be made to maintain a basic standard of gender inclusion in clinical trials worldwide.

4 Lack of awareness, lack of information regarding the site of clinical trials, lack of knowledge, and importance of clinical trials does play a considerable role in the under-representation of women. Though this problem could result in getting a lower number of human subjects overall and that is directly impacting female participation as well. Lack of awareness leads to a lack of information resulting in women not becoming a subject in clinical trials. In countries like India where women are considered a weaker section of the society, they are kept behind the curtain in the majority of households, and hence firstly they remain unaware of the purpose and importance of clinical trials, secondly even if they are aware they are not allowed due to health hazards involved in clinical trials. Lastly, due to a lack of proper information public does have feelings of distrust towards researchers and medical research, and fear of participation [Martin, (2004), p.365]. By awareness sessions people in general needs to be convinced about the importance of active involvement in clinical trials.

   Healthcare providers should also have enough information and knowledge about clinical trials, so if needed they could refer their patients to the trials beneficial for them if they are interested. Specific patients or interested candidates ‘may be powerless to persuade the primary health provider to refer them to clinical research studies if their healthcare provider is not knowledgeable about clinical trials’ (US Department of Health and Human Services, 2022).

5 Time restraint is another factor that hampers women’s involvement in clinical trials. Individuals find it difficult to spare time for participating in a dedicated clinical trial as they have work responsibilities and females do have additional family commitments. Clinical trials might need constant supervision and hence it could obstruct the pre-existing employment of an individual. When clinical research affects their existing employment, ‘an individual could lose their employment and possibly their only access to health insurance benefits’ (US Department of Health and Human Services, 2022). Without healthcare insurance, an individual might not be considered eligible for becoming a clinical trial participant [Martin, (2004), p.389].

6 The time restraint factor becomes a bigger interference when the location of the clinical trial set-up is far away from the place of residence of the participant. Lack of modes of comfortable transportation could also cause hindrance in the participation of women. Travelling far away is not only time-taking but one has to spend money to go and participate in clinical trials. That could not be possible if women from a marginal society, tribal groups, etc. would like to become a participant, as a woman is already overburdened with responsibilities cannot spare time for travelling to far places and would hesitate to spend money on travelling for the purposes of clinical research [Martin, (2004), p.398].

7 There could also be differences noticed in privately funded clinical trials and government-funded clinical trials. Underrepresentation of women can be noticed in both forms of trials; however, the reason could be different (Bird, 1999).

Privately funded trials observe less participation of women due to the reasons cited above. Whereas, in government-funded projects, the researchers do like to get benefits from the databases where the information related to patients is already collected. As per research findings, it was observed that:

> "An important reason for a tendency for male-only studies to predominate is the differential opportunity for men to be in positions where clinical studies are likely to be funded and carried out, for example, receiving treatment in a veterans administration medical center or as a member of the armed services or as a prisoner." (Bird, 1999)

Such actions do create further problems to maintain the gender ratio in clinical trials.

Gender discrimination continued even after the research proved that males and females react differently to different drugs, treatment techniques, diagnostic techniques, etc. (Steinberg et al., 2021). Women are even excluded from the trials which are conducted to develop medicines for them exclusively (Steinberg et al., 2021). The reasons for hindrances discussed above are directly and indirectly produced by stakeholders of clinical trials and updated legislation in this respect may bring a tremendous change in filling the vacuum of women participation in clinical research. More awareness programmes should be conducted by the government with the help of the Medical Council of India and other health sector bodies to achieve the goal of removing sex-based discrimination in clinical trials [Oppenheim, (2016), p.396)].

4 Institutional framework in India concerning participation of women in clinical trials

The collected reports of clinical trials do not contain analysis on basis of gender, nor it is required as per the procedure of regulatory bodies. The reason behind such ignorance is not to recognise the fact that medications and treatments developed do have a different effect on genders. Hence without any further assessment of both the genders, it is inferred that the drug is suitable for the entire mankind. This leads to a clear violation of one's human right of achieving the highest attainable standard of health. However, there are very few reports found which are citing statistical data regarding the under-representation of women, yet the data collected from the World Economic Forum finds that 'India ranks extremely low in terms of gender equality' (Raj, 2011). This inequality does have an impact on their inclusion in social and economic activities (Sengupta, 2017). Participating in clinical trials is a task of both social and economic nature.

The stakeholders in clinical research development could remove the hindrances of unequal women's representation in clinical trials. Legislature can do its part by updating the existing law on clinical health in the country like New Drug and Clinical Trial Rules, 2019 and Ethical Guidelines for Biomedical Research on Human Subjects released by the ICMR in 2000. The need of the hour is to bring progressive laws and updated policies to the healthcare sector. The ICMR brings Ethical Guidelines for Biomedical Research on Human Subjects after CIOMS International Ethical Guidelines were passed and the domestic guidelines are in consonance with the International Guidelines, 'these contain

separate guidelines for women and children trial participants and recognise the possibility of undue influence and coercion in certain relationships. The guidelines have however failed in its realisation due to lack of statutory backing' (Sengupta, 2017). Since the guidelines are only declaratory in nature and do not put any obligation on the stakeholders and hence, they failed to bring an impact. Consequently, we are in need to update the laws which oblige clinical researchers to maintain the gender ratio. Schedule Y of the New Drug and Clinical Trial Rules (2019) needs to include a separate provision for the mandatory inclusion of women and children in trials. The process cannot be ignored especially if the drug made is for human conception at large.

A gender analysis report must be made a mandatory document; regulatory bodies should not allow the trials to go ahead for further phases if a gender analysis report is missing in an application of a clinical trial (Sengupta, 2017). The New Drugs and Clinical Trial Rules, 2019 states that "women reproductive or developmental toxicity study reports need to be submitted if female patients of childbearing age are going to be involved in phase II and III clinical trials" (Cdsco.gov.in, 2022). Firstly, for phase 1 only male fertility is demanded as a mandatory document, secondly, for phases II and III, women's inclusion in clinical trials is not made compulsory. Women-specific reports are demanded only 'if' women of childbearing age have been involved in the trial. There is no mention in the rules for maintaining gender ratio during trials and submission of reports at the end based on gender analysis (Cdsco.gov.in, 2022). However, in animal trials, it is required to test the drug or medicine on both males and females in an equal ratio.

The laws in India are still not in favour of including the vulnerable population in clinical trials, women being a part of the weaker section are often excluded from participation in clinical research (Clinical Research Regulation for India | Clinregs, 2022). The Clinical Trial Rules regarding clinical trials also showcase women in special situations (like pregnant females, lactating mothers, elderly females, etc.) in the category of vulnerable persons, and hence involving them in clinical trials demands special care. So, to avoid any additional burden, females in special situations are not included in trials where the medicine or the drug is not developed specifically for their consumption [Schedule 1(3)(3)(c) of The New Drugs and Clinical Trial Rules, 2019]. Clinical researchers do not like to increase the procedural burden and future liability on themselves by including females in clinical trials when this is not even made mandatory in the existing law on clinical trials in India. Furthermore, as per norms, it is required for researchers to adopt additional measures if the clinical study has involved a pregnant or lactating mother, following conditions need to be met in such situations:

1 Pregnant women, nursing women should be included in the trials only when the drug is related to consumption for such women only or for foetus/infant development or 'where the data generated from women who are not pregnant, or nursing is unsuitable' (Clinical Research Regulation for India | Clinregs, 2022).

2 Reports need to be submitted by researchers to the Ethics Committee stating the need for the inclusion of pregnant or nursing females in the trials. The reports should state the health benefits of the drug for such a category of women.

3 Females of childbearing age if included in clinical research must be informed about all the potential risks involved in the administration of the drug. Must be informed about the risks involved in getting pregnant in the future if any, risks to the foetus if any, etc.

4 Right has been given to pregnant women to participate in clinical research to enhance their healthcare demands. However, participation of women in such situations is allowed only when the research is conducted to obtain drugs specifically related to the health of pregnant or nursing women or for the better development of a foetus or infant.

5 Nevertheless, women shall continue to breastfeed until unless nursing the infant is stated as dangerous by the healthcare professional at the clinical trial site.

5 Impact on the health rights of women due to gender inequality in clinical trials

A report submitted by the Centre for Women's Health Gender Biology at the Mary Horrigan Connors Hospital at Brigham states that "females are mostly excluded from human studies and even in cases where they are included, their representation is either very poor or the data collected is not analysed separately on the basis of gender" (Sengupta, 2017). With due time it has been ascertained that due to biological differences, the effect of the same drug or diagnosis method varies in men and women and there is a need to study clinical trial reports based on gender. The data collected during the trial must be analysed based on gender (Bird, 1999).

As per a global report, the life expectancy rate of women is more than men. The average life expectancy of men lies around 70 years whereas the same lies around 75 years for women (Worlddata.info, 2022). The study shows that the average life expectancy of women surpasses the life expectancy of their male counterparts not in some countries but almost in all the countries and the difference is very much noticeable. Due to this, it can be assumed that women are going to consume more healthcare services than men in their entire life and they are going to be the major consumers of the healthcare industry (Weisman and Cassard, 1999). Old age diseases are also going to affect women more due to longer life expectancy and hence not only prescription drugs, but diagnostic techniques would be used more by women. Being the foremost consumer of the healthcare system women are still underrepresented in the clinical studies of these drugs and diagnostic methods which are prescribed to them (Healthline, 2022). Their healthcare needs are neglected due to exclusion from clinical studies, and it does have an unrecorded adverse impact on their health. Furthermore, it does impoverish women from accessing available healthcare facilities to their optimal usage (Sengupta, 2017).

There are several other assumptions made at the time of approval of drugs that could further lead to the derogation of health rights for women. For instance, due to the underrepresentation of women in clinical studies, it may be assumed that the drug and dosage approved for consumption of males during clinical trials is effective for women as well. Likewise, the drugs not approved for usage as they were not found efficacious on males during trials might be effective on women. Hence lack of women's participation in clinical studies is depriving them of receiving effective treatment (Bird, 1999).

Underrepresentation of female animals in pre-clinical studies and of women in human trials is happening worldwide yet it is not considered worth discussing as an issue at the global level. Many drugs in the USA have been approved by FDA back in the 1990s when no attention was paid to the gender ratio in clinical trials (Healthline, 2022). The dosage prescribed for males and females of approved drugs is the same regardless of hormonal and biological differences. Scholars at the University of Chicago conducted research and prescribed the same dosage of drugs to both genders, and it was analysed that 'in more than 90% of cases, women experienced stronger side effects than men and experienced adverse drug reactions at nearly twice the rate of men' (Healthline, 2022). The study is even supported by Nancy Pire-Smerkanich, working as Assistant Professor at the University of Southern California in the School of Pharmacy, she states that the results of the study might sound surprising but they are not as both genders react and metabolise the same medicine differently. Later, she also emphasises the fact that "inclusion of women in early phases of a clinical trial is important as during these phases we learn about how the drug works in the body, so it would be important to include women as early as possible in the drug development process" (Healthline, 2022).

Studies have also administered that the underrepresentation of women varies in different age groups; it was observed that clinical trials conducted specifically on older persons demonstrate a very less amount of women participation. The trials which allow the inclusion of persons of any age also see that older women are rarely subjected to clinical trials and hence the absence of older women participants leads to a smaller number of studies being carried out specifically on them. Lack of interest in participation poses a challenge for the clinical researchers as well to find interested participants (Bird, 1999). Though redress to this problem could be to conduct clinical studies in women-dominated places like nursing homes, old-age homes, primary school teachers, etc. Clinical trials conducted in such places could provide an abundant number of female participants and that too of different age groups (Bird, 1999).

Revising the existing regulations and laws is mandatory becomes female inclusion in clinical trials becomes a necessity of time. The impact of underrepresentation is presented through various reports and studies now, ignorance of focusing on this issue can be critical. Resources by the governments are to be allocated to the stakeholders in a manner to focus on female-based clinical trials. Maintaining gender ratio and analysis of reports on basis of gender in clinical trials should be made a compulsory part of the procedure. Women being the biggest consumer in the healthcare system should be brought to the forefront and drug development be done considering the heterogeneous need of the society (Healthcare-in-europe.com, 2022).

Many developing countries are seen to be amending their policies and laws regarding clinical trials. The Federal Food and Drug Administration (FDA) have changed its guidelines when the impact on women's health was studied within the country due to their underrepresentation in clinical studies (Bird, 1999). However, separate protection guidelines were passed regarding women of reproductive age, yet drug manufacturers were asked to maintain gender ratio in clinical trials (Bird, 1999).

Women are excluded from participation in clinical trials merely on basis of convenience. Researchers and pharma companies need to keep extra precautions due to women's inclusion; gender-based analysis of reports takes up more resources and time. Hence, the cited reason for non-involvement of childbearing age women is often used as

a shield to avoid the cumbersome burden and to remove any possible future claim of offspring compensation as occurred in the *thalidomide* case.

The existing model of drug testing is *prima facie* a 'male model', as the data gathered in clinical studies is based on male participants. The results obtained in such clinical studies are assumed to be equally confirming to women's needs as well. This is the assumption that is keeping us behind the blindfold. Relying on data collected by studying male participants is not affecting an individual's right as such; however, it's attacking the collective right of women. They are losing the opportunity to participate. If the researchers will not seek women's participation and will not advertise for the same, then women might never be able to generate interest in becoming clinical trial participants. Awareness and firsthand experience are necessary to promote the idea of participation in clinical studies to pave a way for accessing more efficacious medical treatment for the entire women community (Bird, 1999).

Even though science achieved many unimaginable targets today, however, there is a scarcity of literature and available data with respect to certain diseases, little variations in the pattern of research study might result in better exploration in relation to the diseases or concerning drugs. Gender analysis in clinical trials could bring more satisfying results in pursuance to find the cause of occurrence and prevalence of a disease in human beings (Steinberg et al., 2021).

As cited by Weisman and Cassard (1999) in their research paper that 'inadequate research leads to information deficit in a different area of healthcare which affects women differently'. There are diseases like breast cancer, ovarian cancer, etc. which specifically affect women and hence lack of participants in clinical studies of the drugs developed to treat such diseases are not satisfactory then the entire women population is compromising on their healthcare. The data collected in such cases will not even be sufficient to consider it as a foundation for further research and hence this gap would go unnoticed by the researchers though the women population unknowingly is paying a huge price due to this fault. Then comes the diseases which affect men and women differently like AIDS, and the lack of female participants in clinical trials of drugs developed for treatment of such diseases does result in an information deficit. The lack of existing knowledge on basis of gender is impacting women's population in a manner that goes unobserved. The same information deficit has been observed in procedures adopted for the prevention and treatment of heart diseases in women patients (Weisman and Cassard, 1999). Women are often made to go through the same diagnosis test as men; however, due to biological differences heart blockage is not deducted in women through these tests. Hence the entire blame goes on to the clinical researchers for collecting data with a lack of knowledge regarding the effect of treatment on both genders (Weisman and Cassard, 1999). As per Mastroianni (1998, p.182) of the University of Washington School of Law 'liability for exclusion may arise when a woman takes a drug or treatment that was not tested on women but proves to be more dangerous or less effective in women once the drug is on the market'. If any drug is showing adverse health effect then such matter should be persisted before the court to check whether adequate testing on the required number of females have been done or not before marketing the drug as fully effective on both the genders. As observed in many foreign cases that liability has been imposed upon manufacturers by the courts when it was established that the marketed drug has not gone through adequate testing on different categories of women [Mastroianni (1998), p.182].

6 Conclusions

Female inclusion in clinical trials has become a requirement of time, so existing policies and laws must be revised. A global instrument must be drafted to include minimum standards to be followed by member countries. The domestic legislation is to be framed by the state parties to remove the disparity of the underrepresentation of women in clinical trials by eliminating the obstacles resulting in lesser participation of women in clinical research activities. It's been observed that the major reasons for the underrepresentation of women in clinical studies are lack of understanding of preventative methods, illness symptoms, lack of awareness, household responsibilities, paucity of time, lack of transportation facilities, and child-bearing age, etc. Developing a law will not be sufficient to bring the needed change, implementation of the laws and the strategies are necessary. Managing these hurdles and creating a better opportunity for women through awareness camps, monetary help, transport facilities, medical insurance, and free treatment post clinical trials in case of severe adverse effects represent some of the ways through which the hurdles hamper women's inclusion in clinical studies can be removed.

The consequence of underrepresentation is currently addressed in a variety of papers and studies, and failure to focus on this issue can be disastrous. Government resources should be given to stakeholders in a way that focuses on female-based clinical trials. In clinical studies, maintaining a gender ratio and analysing reports based on gender should be considered a mandatory element of clinical studies. Women, being the largest consumers of healthcare, should be prioritised, and drug development should consider the diverse needs of society.

Men and women are noticed in different studies reacting differently to the drugs administered and the reasons ascertained leading to such differential treatment are mainly biological, hormonal, social, behavioural, or a combination of these. Therefore, it can be said that clinical trials conducted on gender-based analysis would improve the overall health of the entire population. The gender-based study would result in a better understanding of men's and women's responses to the therapy and could lead to improved medical therapies for both men and women.

Meanwhile, to bring further change clinical researchers should be made aware of the importance of gender-based studies in clinical trials. The stakeholders in a clinical study should not be considering female inclusion as a burden but it must be considered a necessity by them. It must be valuable for clinical researchers to find drug effectiveness in a heterogeneous population.

India is becoming an upcoming hub of global clinical trials with an abundance of patients willing to become clinical trial participants for basic monetary benefits. In a country that is in demand for its advantage to provide skilled researchers, doctors and naïve patients must have a separate authority to regulate health research going on in the country. The authority must have a branch dealing specifically with the promotion of women's participation in clinical studies. The body should focus to advance existing strategies to collect more data to analyse the healthcare needs of women. The increasing number of women participants must not be the only objective, however, an increase in the number of women as researchers and investigators in clinical trials could also lead to the development of more comfortable and safe feelings amongst female participants. The experience of participation in clinical trials for women participants must be optimal, so

that they may convince other females in the community to register themselves as participants for seeking better healthcare benefits for themselves as well as for the entire women community in the country.

Lastly, the benefits of inclusion of women in clinical studies are going to bridge the existing gap in the information collected before marketing a drug. Female participation would lead to testing of the effectiveness of the same techniques and drugs on women and hence women will not be suffering a blow on their healthcare rights. Hence, women's participation in clinical studies should be enhanced to respect, protect and fulfil their basic human right to health.

References

Bird, C.E. (1999) 'Women's representation as subjects in clinical studies: a pilot study of research published in JAMA in 1990 and 1992', *Women and Health Research: Ethical and Legal Issues of Including Women in Clinical Studies, Vol. 2: Workshop and Commissioned Papers*, National Academies Press (US), Washington (DC) [online] https://www.ncbi.nlm.nih.gov/books/NBK236566/?report=printable (accessed 11 March 2022).

Cdsco.gov.in (2022) [online] https://cdsco.gov.in/opencms/resources/UploadCDSCOWeb/2018/UploadPublic_NoticesFiles/faqnd.pdf (accessed 21 March 2022).

Clinical Research Regulation for India | Clinregs (2022) [online] https://clinregs.niaid.nih.gov/country/india#vulnerable_populations (accessed 18 March 2022).

European Court of Human Rights (1979–1980) *2 EHRR 245*, 26 April 1979 [online] http://www.hrcr.org/safrica/limitations/sunday_times_uk.html (accessed 16 March 2022).

Healthcare-in-europe.com (2022) *Women and Men are Each Underrepresented in Clinical Trials* [online] https://healthcare-in-europe.com/en/news/women-men-are-each-underrepresented-in-clinical-trials.html (accessed 29 March 2022).

Healthline (2022) *Women Underrepresented in Clinical Trials: Why That's a Problem* [online] https://www.healthline.com/health-news/we-dont-have-enough-women-in-clinical-trials-why-thats-a-problem (accessed 25 March 2022).

Martin, N.K. (2004) 'Simple inclusion or adequate representation – racial disparities in HIV/AIDS clinical trials', *Rutgers Race & L. Rev.*, Vol. 6, No. 2, p.365.

Mastroianni, A.C. (1998) 'HIV, women, and access to clinical trials: tort liability and lessons from DES', *Duke J. Gender L. & POL'y*, Vol. 5, No. 167, p.17.

Oppenheim, S.F. (2016) 'Jack & Jill take lots of pills, but Jill comes tumbling after: gender inequality in privately funded early phase clinical trials', *WM. & Mary J. Women & L.*, Vol. 22, No. 393, p.396.

Primeau, A.S.B. (2022) *Underrepresentation of Women in Clinical Trials Persists*, Cancer Therapy Advisor [online] https://www.cancertherapyadvisor.com/home/cancer-topics/general-oncology/cancer-women-female-representation-clinical-trials/ (accessed 3 April 2022).

Raj, A. (2011) 'Gender equity and universal health coverage in India', *Lancet*, 11 January, http://dx.doi.org/10.1016/S140-6736(10)62112-5 (accessed 15 March 2022).

Schedule 1(3)(3)(c) of The New Drugs and Clinical Trial Rules (2019) [online] https://cdsco.gov.in/opencms/export/sites/CDSCO_WEB/Pdf-documents/NewDrugs_CTRules_2019.pdf (accessed 19 March 2022).

Sengupta, A. (2017) 'Clinical trials in India: a way towards impoverishment, *Nalsar Stud. L. Rev.*, Vol. 11, No. 1, p.1.

Steinberg, J.R. et al. (2021) 'Analysis of female enrollment and participant sex by burden of disease in US clinical trials between 2000 to 2020', *JAMA Network Open*, Vol. 4, No. 6, p.3 [online] https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2781192 (accessed 3 April 2022).

US Department of Health and Human Services (2022) *Outreach Notebook for the Inclusion, Recruitment and Retention of Women and Minority Subjects in Clinical Research*, p.57.

Weisman, C.S. and Cassard, S. (1999) 'Health consequences of exclusion or underrepresentation of women in clinical trials', *Women and Health Research: Ethical and Legal Issues of Including Women in Clinical Studies: Vol. 2: Workshop and Commissioned Papers*, National Academies Press (US), Washington (DC) [online] https://www.ncbi.nlm.nih.gov/books/NBK236583/ (accessed 6 April 2022).

Worlddata.info (2022) *Average Life Expectancy by Country* [online] https://www.worlddata.info/life-expectancy.php#:~:text=Life%20expectancy%20for%20men%20and%20women&text=The%20world%20average%20age%20of,78.4%20and%20respectively%2083.8%20years (accessed 25 March 2022).