

**CHAPTER - II**  
**REVIEW OF LITERATURE**

Reviewing literature related to the research area is a vital stride in commencing research. It helps in explaining and characterizing the matter, expressing aim and objectives, figuring hypothesis, selecting proper outline and procedure of research and additionally deciphering the outcomes in the light of the research work as of now embraced. In this section, an attempt has been made to give a diagram of different parts of this review through the audit of existing writing (Shodhganga, 2017). The sources referred include various national and international journals, books, doctoral study theses, research papers, reports, magazines related to crime reports, internet sites, newspapers etc.

This Chapter mainly focuses on reviewing the latest related research articles and to see the methodology and parameter used in that research and finally the outcome of the research. In this chapter ample numbers of related international and national research articles are looked over. This chapter contains only those literatures which are pertinent to the present study out of total reviewed articles.

In order to have reasonable and systematic review of literature the studies related to significance of forensic evidences will be classified under following headings.

- Studies allied to forensic evidence at Police investigation Level
- Studies allied to forensic evidence Court Level
- Studies allied to various crimes
- Studies allied to different evidences/proofs
- Comprehensive Case-proceedings Studies

### **Studies Allied to Forensic Evidence at Police Investigation Level**

A study by **Ramsay** (1987) found that forensic science laboratories gave "supportive information" to the police in around seventy five percent of situations where suspects had been recognized (suspects were acquitted in around 7% of cases pertaining to evidence collection), however in under 40% of cases without suspects. This line of research did not proceed into the 1990s and past.

A study by **Boland B. et al** (1983) showed that approximately just about half portion of police apprehensions brought about formal charging by a prosecutor. Out of the cases charged, around 70– 80% brought about conviction; though , most by far (90%) was settled through a plea bargaining and just 10% had really gone to trial.

**Forst, Lucianovic, & Cox** (1977) reviewed the case results after capture. According to this review, over 70% of captures did not prompt to conviction. Three components were perceived by them which lead the capture to conviction: the whereabouts of witnesses, the diminishment of time between crime occurrence and capture, and the existence of "tangible evidence." But, the tangible evidence was not characterized in the review nor it was known whether this proof was truly analyzed in any forensic lab.

**Chaiken, Greenwood, & Petersilia et al** (1976) concentrated on detective activities and found that data given by victims to the investigating officers at the crime scene was most compelling in speculating whether a crime would be resolved. A little part is played by Traditional investigation strategies and physical evidence in comprehending criminals. This review additionally found that physical evidences are accessible in most extreme cases and latent fingerprints in over half, however the fingerprints prompted to the distinguishing proof of the culprit in just 1% of cases.

### **Studies Allied to Forensic Evidence at Court Level**

**Feeney, Dill, & Weir** (1983) examined cases identified with theft and robbery captures and discovered evidence as the most imperative factor foreseeing conviction yet the part of evidence in plea bargaining is uncertain. **Neubauer** (1974) depicted plea-bargaining as a "small scale trial" where the prosecutors look at the evidence as much as judges would.

**McDonald, Rossman, & Cramer** (1979) similarly noticed evidence and witnesses as most extreme base in judgments to appeal plea or to take a case to trial. In this way, there is little understanding about the significance of evidence

and little learning about the significance that different sorts of evidences perform role in court decisions and in addition in accepting a petition.

**Eisenstein & Jacob** (1977) attempted to evaluate the impact of evidence on genuine case results at the court level and found that quality of evidence was related with probability of conviction and decision charged. However, their strategies were simple, categorizing of different sorts of evidence was missing which ignored examination of the impact of an evidence.

**Lassers** (1968) executed investigation of court documents of capital cases evaluated by the Illinois Supreme Court and found a generous reliance on assertion of guilt and witness testimony to secure convictions as opposed to the infrequent utilization of scientific evidences (approx. in 25% cases)

An investigative study of adjudicators' behavior was explored together by **Kalven and Zeisel** (1966) and found that most judges followed the evidence introduced and achieved decisions indistinguishable to those of judges. They additionally archived the exceptional utilization of forensic expert witnesses at trial amid that time.

Research related to the part played by evidence at court level is better documented up to a definite extent equated to police investigation levels.

### **Studies Allied to Various Crimes**

A study by **Cross et al.** (2014) aims to examine data from forensic medical examinations, crime laboratory analysis, and police actions in samples of sexual assault cases in reported in the State of Massachusetts, USA. Like other studies, this study too was based on retrospective case record reviews. Their study found 51% documented non-genital injuries in victim and 34.5% documented genital injuries. They found higher rates of biological evidence being documented. DNA was not frequently utilized for DNA profiling of suspects. However, 26.9% of their sample had DNA profiles generated. This study suggested that injury evidence and biological evidence have the potential to have a major impact on criminal justice outcomes in sexual assault cases. The probabilities of an arrest were significantly

greater when genital injury were documented and the probabilities of an arrest following crime laboratory analysis were much greater when there was a DNA profiling.

A study to ascertain the role of forensic medical evidence in the prosecution of adult sexual assault cases executed by **Quadara, Fileborn, & Parkinson** (2013). This paper reflected whether forensic medical evidence was associated with positive legal outcome and the role of forensic medical evidence at key decision points in the criminal trial. This empirical research presented an ambivalent picture about forensic evidence regarding what is the role of forensic evidence and what it should be. The author said “That is not to say that forensic evidence is of no use in sexual assault trials—it can clearly play an important if not crucial role at times. At the same time, the perceived benefits and uses of forensic evidence should not be overstated or, indeed, misrepresented.”

**Johnson et al.** (2012) conducted a review on 602 sexual assault cases. The data was acquired from National Institute of Justice. They depicted that the forensic evidences were gathered and analyzed in such cases. Forensic evidences had significant influence on taking into custody, charging, prosecuting, adjudicating and sentencing the guilty parties. They have surveyed the impact of forensic evidence in the criminal justice processing of rape cases. In result, this article conflicts the hypothetical capability of latest forensic science innovations in the examination of sexual assault crimes.

A research study by **Baskin and Sommers** (2012) found the impact of forensic evidence on the procedure of assault and theft cases. The study directed a planned examination of formally registered cases information within five regions from time of police reporting to conclusive case result. The outcomes demonstrated that forensic evidence was gathered in under 33% of all robbery and assault cases. Legal proof impacted ultimate result for neither robbery nor assault cases. Cases, where physical evidence gathering is there, are not any more liable to achieve conviction than those without such proof. The victim and witness' declaration observed to be more influencing for criminal case progress.

A parallel study was carried out by **Rees** (2010) in which it was found that Forensic Medicine Evidences end up being evidence of significant means and only of advantage when there is evidence of injury. Cases with remarkable wounds are more predicted to move forward than cases without such evidence, since they fit with judges' assumptions and accordingly have a higher opportunity of securing a conviction.

**Kashyap** (2010) conducted interviews of doctors, health rights activists, women's rights activists, prosecutors, other lawyers, judges who have served in criminal trial courts and parents of survivors of sexual violence. As per this report almost all the doctors who were interviewed said that India at present do not have any policy or guidelines to govern the forensic examination of survivors of sexual. There is a need for introducing a program for therapeutic care of survivors of sexual violence and their families by Indian government. Moreover, doctors suggested that Indian government should introduce training to demonstrate how to use protocols and formulate medical opinions in an accurate and scientific manner without biases. Forensic experts, lawyers, and health activists told that due to lack of such training doctors are left ill-equipped and most doctors are unaware about appropriate evidence collection techniques and writing reliable and accurate medico-legal opinions.

A study by **Rebecca C. et al** (2009) conducted a research on involvement of Forensic medical Evidence gathered by rape investigators in guessing rape case verdicts. They inspected what variables anticipated adult rape case examination and trial in a Midwestern state with such a study. They looked at the far-sighted utility of victim attributes, type of assault, and forensic medical evidence in revealing case results. The outcomes expressed that anticipation of case results was best accomplished by the consideration of medico-legal factors of forensic evidence. Forensic medical evidence obtained by the rape investigator represented huge and remarkable difference on the case judgments, further than characteristics of victim and type of assault.

**Naidu** (2008) carried out a study to evaluate medico-legal aspect of Crime against woman in India. He stated that due to lack of scientific awareness and

medico legal knowledge among victims, investigating agencies, medical and para medical staff, the end result is either 'justice hurried' or 'justice delayed'. He recommended the need of providing importance to forensic nursing, imparting medico legal knowledge to para medical staff and health workers in rural and semi urban levels regarding handling and reporting of crimes against women cases.

A study by **Du Mont & White** (2007) uncovered that injury, a medical evidence, was just examined and recorded in a few number of rape cases, and when wounds were not found, it was frequently the case that the cases did not continue beyond police procedures. In addition, in situations where wounds were recorded, general physical wounds (non-genital) were the most grounded indicator of a positive legal outcome' and 'when females borne minor to serious wounds, such wounds were most firmly linked with charging and conviction.

**Gray-Eurom & David** (2002) endeavored to decide the relationship amongst historical and physical evidence with legal verdict in rape cases. A population based, review survey of rape cases pertaining to forensic evidence was directed in Duval County, FL, amid a two years' time span. In this review different factors were viewed as age, race of victim, injury evidence (body, genital, or both), presence of semen at the time of the forensic investigation, weapon utilized, and whether the victim knew the offender. The outcomes showed that among all factors the age of the casualty, the presence of injury, and the utilization of a weapon all indisputably correspond with fruitful accusation.

**McGregor, Mont, & Terri** (2002) carried out a review to portray the medico-legal detections in adult victims of rape incidents surveyed. These cases were examined in an emergency division of hospitals, registered to the police and recorded by the courts. The judicial proceedings of cases were observed over the review time frame, and figured out if medico-legal detections are related with preparing of charge sheets and . This was a review outline of all police-registered cases at the British Columbia Women's Sexual Assault Service for the period of five years from January 1993 to December 1997. The relationship of medico-legal findings, socioeconomic status of victims, and assault traits with documenting of charges (within the group of cases in which a suspect was recognized by police)

and conviction (within the group of cases in which charge were recorded) was analyzed by utilizing statistical methods of logistic regression. According to the outcomes, charges were documented in 151 (32.7%) and accused held convictions in 51 (11.0%) of the 462 cases inspected in present review. Genital wounds were seen in 193 (41.8%), and sperm-semen positive forensic outcomes were acquired in 100 (38.2%) of the 262 specimens analyzed. Reported intensity of injury had a noteworthy positive relationship with both preparing charge sheet and conviction. Thus reporting of extent of injury is an essential stride in upholding the importance of injury documentation in the medico-legal examination of rape victims.

Studies of burglaries by **Eck J.** (1979) from Stanford Research Institute and the Police Executive Research Forum positively recognized key variables including fingerprints that foretold case outcomes in 85% of cases.

### **Studies Allied to Different Evidences**

**Patel, Gautaman, & Jangir** (2013) carried out a study to examine the role of DNA in Criminal Investigation with regard to admissibility in Indian Legal System. IN this study researchers surveyed the science of DNA identification and its use during the course of criminal investigations and during court proceedings, including trials, petitions and post-conviction proceedings. It expressed the chief advantage of the expanding use of DNA fingerprinting in the criminal justice system with special emphasis to India. They considered the decisions given by Supreme Court and different High Courts in India during 2011 in which the DNA evidence had significant involvement. They found that DNA was important during personal identification and disputed paternity cases. It was used in 74 percent such cases, whereas, during 4.7 percent murder cases and 2.3 percent cases of rape with murder. In 51.2 percent cases DNA samples were extracted from blood evidence, while other biological evidences were used in very less number of cases. They found that there was not made any conviction, particularly life imprisonment or capital punishment, depending on DNA evidence in Indian states.

A research by **Schiffer** (2009) is the intersection of forensic science and criminology, as well as other areas including social sciences and psychology. A general overview of the relationship of forensic science and judicial error formed one part of the study. All areas of forensic science and of types of judicial error were considered. A particular focus was on the area of identification evidence such as fingerprints and DNA profile analysis. The researcher has found that the work in laboratory seemed to be most vulnerable to error.

A study was conducted by **Garrett & Neufeld** (2009) to assess the reliability of DNA evidences in criminal trials. The forensic expert testimony in the trials of innocent people was explored where all of them got acquitted by post-conviction DNA fingerprinting test. Trial transcripts of 156 cases pertaining to forensic expert testimony were considered for this study. These testimony chiefly involved serological analysis, hair analysis, soil, fiber, shoeprint, fingerprint and bite marks and DNA tests. This trials included testimony by 72 forensic scientists from 25 different states in U.S. employed by state and local laboratories. Present study found that in the trials of these acquitted offenders, 82 cases or 60% forensic experts appeared in the court provided invalid testimony at trial. Various errors by forensic analyst were listed in the article. Suggestion to regulate the practice of forensic science during criminal trials for contending the miscarriage of justice were given by the researches.

**Roberts, Taupin, & Raymond** studied the role of DNA evidence in criminal justice system. As per this study accomplished in Victoria, approximately two thirds of all cases, pertaining to DNA profiling, have been sexual offences. Nevertheless, DNA profiling was useful in only a comparatively lesser number of sexual offences. Out of the total sexual offence cases submitted to the State Forensic Science Laboratory in the two years from July 1989 to June 1991, only 15% cases were analysed using DNA profiling. It is evident from their analysis that DNA evidence is hardly ever crucial at the trial. DNA profiling is more valuable in the earlier stages of an investigation than court trial. This has proved as an effective investigative tool for eliminating falsely suspected people for involvement in crime. It can provide very strong evidence of participation, and this is often sufficient to persuade the offender to plead guilty.

**Raymond** carried out another study on cases of state Forensic Science Laboratory of Victoria. The author verified that in the 7 homicide cases and 9 sexual offence cases DNA profiling was carried out. The Author identified that though DNA profiling has been overplayed by the media, the public, and some scientists, there is no doubt that it is an exciting and significant step forward in the field of forensic biology. This paper used four of the Laboratory's cases to highlight this point.

### **Comprehensive Case-Proceedings Studies**

A study conducted by **Grover & Tyagi** (2014) on Development of Forensic science and Criminal prosecution-India puts a light on the history and development of Forensic science in India and its role in Criminal prosecution. The author has provided a detailed history along with the details of subdivisions of this science. They have also tried to bring into light the fact that in certain cases the suspects cannot be compelled to give samples. The researches have provided some suggestions with regards to the changes required to be brought in the Criminal Procedure Code to provide enough space to the principles of forensic science like specific laws to provide guidelines to police for obtaining genetic information, creating a national DNA database to get help fighting terrorism. Also awareness of this science is a must to use it for crime case proceedings. Expert professional must be motivated to work on the medico-legal cases and also the court must provide a good atmosphere so that the experts get motivated to attend the court and get more involved in the justice and hence the betterment of the society. The authors have successfully thrown a light on the origin and development of forensic science and also justified its role in Indian Justice System.

The article by **Anika & Fraser** (2014) on Effective use of forensic Science in volume crime investigation, puts up an eye on the use of the forensic science in criminal investigation and the factors hindering the proper use of forensic science during investigation in spite of technological advances. No doubt, many reports have been published considering the use of forensic science in the investigation of volume crimes. The reports also show the effective use of Forensic Science in the investigation. But some factors like knowledge and training for the investigators,

gap in the proper data transformation between the investing offences and the experts, results time bounding and also the deployment of examining office resources create a barrier in the effective use of this science for proper investigation we can obviously see the technological advances in this science but the above mentioned factors are very disturbing in the achievement of the required output. Proper training is a must to achieve the appropriate output and this has been very properly highlighted by the authors of this article.

**Lee & Pagliaro** (2013) in a study on Forensic evidence and Crime Scene Investigation and, focused on the connection between the Forensic evidence and Crime scene investigation. Evidence is an important part of any crime proceedings and hence it has be taken utmost care of. The crime scene id first investigated by police officers and evidence collection is done by them. It is very much clear that the officers must have particular / special training with regards to the importance and handling of the evidence. The authors stated different types of evidences and admissibility of the evidences. It is plausible that the judges do not have the complete idea of potential of forensic evidence. The authors have reported that the forensic laboratories require quality control programs, funding for laboratories also needs to be increased, the need of the education for scientists and standardization are very important. The training of the Crime Scene Investigation is very important for everyone who is associated in the process and hence the end results can prove to be very useful and provide high quality of justice. The authors have rightly brought into notice the problems hence found presently.

A research entitled 'Forensic Science: A boon to Criminal Justice' by **Handoo** (2013) has especially put up light on its administration with special reference to Jammu and Kashmir. He has expressed that the role of forensic science in Indian Criminal justice administration is still at rudimentary stage in spite of tremendous technological advancements. It was also mentioned that the forensic science should be used in all the cases concerned as it can be useful for the welfare of the society. Also the author has put up a light upon the pace of the ongoing investigations as numbers of cases which are pending is more. Here the author suggested that the screening is required to set up the priority before

referring the case to FSL. He also specified the dependence of FSLs on outsiders for the hi-tech analysis. It was suggested that the presence of forensic scientist at the time of investigation for higher recovery, submission and usefulness rates of forensic evidences. The author has rightly put his views on the legal and the scientific approach and the problems faced in the investigation. The suggestions made by the author can be useful for the other states of India also. He advised the necessity for amendment in Cr.P.C. with reference to forensics for the valuable justice.

**Strom & Hickman** (2010) studied the ratio of unanalyzed forensic evidences and the reason behind that. In this study they explored forensic evidence administration in case samples collected from nationwide state and local police agencies nationwide. They surveyed cases for a period of five years, and found that 14% of homicide cases and 18% of rape cases were remained unsolved due to forensic evidence being not submitted to a forensic laboratory for analysis. On an average, 40% cases out of these were having DNA evidence. The utmost often stated reason for not putting forensic evidence forward to Laboratory was 'lack of suspect'. Author stated that the investigative capabilities of forensic evidence are not being recognized by police agencies. It is a critical need for the law enforcement agencies to get additional training on the use of forensic science in investigation.

Another comprehensive case procedures study was initiated by **Peterson, Sommers, Baskin, & Johnson** (2010). The review was led on 4250 criminal instances. These cases incorporated a probability based specimen of 4205 criminal cases of the year 2003, chosen arbitrarily from Los Angeles County, Indianapolis (IN), and three provincial Indiana areas. Complete case procedures, starting from police reports to court decisions, were considered. Take notice of that utilization of DNA profiling and the CODIS database were not as latest or predominant as they are today. 400 murders, 602 sexual assaults, 859 aggravated assaults, 1081 robberies, and 1263 burglary cases were incorporated. These sorts of offenses portray the entire range of serious crimes categories where physical evidence is commonly gathered and analyzed. The information was brought together from police investigation reports, forensic laboratory reports, and

prosecutor case documents. This review followed the progress of physical evidence as the case continued from investigation to apprehension, charging, and decision. Each sort of crime was examined separately. For burglary, assault, robbery, and rape cases, it was expressed that accumulation of crime scene evidence was prognostic of arrest. Among murder cases, those with crime scene evidence will probably be charged. For Rape and assault cases, forensic reports anticipated charging decisions. Notwithstanding scientific evidence, a few other case qualities anticipated case results, particularly witness, and victim testimony.

**Baskin & Sommers**, (2010 and 2011) co-authors of the Peterson et al. study, recently re-examined the study data in two distinct articles and reported conflicting results.

In the research paper on Crime Conviction Imbalance and Use of forensic Science Evidence, **Gaur** (2005) has emphasized on the decreasing moral values of the society and that ultimately points out the performance the eye-witness. It is obvious that as the moral values are going down in the society, conviction based on the words of such witnesses is not reliable. People can lie but evidence don't. It's a bare truth and hence the forensic investigation becomes a must in the prevalent society to balance crime and conviction. This obviously will need great efforts especially with regards to producing the professionals in the field as the crime rate is increasing day by day. The statistics given by J.R. Gaur states that 'The conviction rate for certain offences in the country ranged as low as 14.9 percent under Terrorist and Disruptive activities Act, followed by hurt cases 4.8% and in most other IPC offences 40.6%.' He suggested that the quality and prompt report from the forensic scientist can certainly fulfil the aspirations of the society from forensic scientists.

A subsequent similar analysis by **Peterson, Ryan, Holden, & Mihajlovic** (1987) Peterson et al uncovered the utilizations and impact of scientific evidence in the charging, plea bargaining, court trial, and penalizing phases of the criminal justice process. At the time of formulating charge sheet, the scientific evidence had minor impact in a large number of criminal cases, apart from drugs, assault, and arson cases. Cases from five distinct states were followed and Guilty pleas were

usually found in over 90% of cases. In situations where the scientific evidence intensely associated with the crime activities, prosecutors were less inclined to offer a plea bargaining. Another study investigated that forensic evidence had an exceptionally limited part in court decisions to convict a culprit, in comparison with the impacts of other evidences. However, scientific evidence had its vital impact at penalizing stage of case proceedings.

Studies by **Peterson, Mihajlovic, & Gilliland** (1984) are the best far comprehensive researches of the utilization of scientific evidence in the examination and prosecution of cases which were financed by National Institute of Justice, USA in the 1980s. They analyzed around 2700 arbitrarily chosen cases obtained from four states across the nation. Research was completed on around 1600 cases with analyzed physical evidence and around 1100 comparative situations where no physical evidence was gathered. Different sorts of offences were focused like assault, homicide, robbery, burglary and aggravated assault. Case records were collected from police organization, forensic laboratories, prosecutor, and court documents. They found that forensic evidences were gathered and inspected in just 20–30% cases out of all crimes. In addition, according to the category of crime, this rate differed considerably. For example, the police gathered physical evidences in nearly 100% of murder and drug cases and 75% of assault cases, however in just, 33% of burglaries, 20% of robberies and 10–20% in attempt to murders. Most oftentimes gathered and examined proofs were Blood, hair, weapons, and fingerprints. Offences, with scientific evidences, had three times more prominent conviction rate in courtroom than in situations where such proofs were not utilized.

### **Conclusion of the Chapter**

The foregoing research reviews made it clear that forensic evidence and its utilization is attaining higher importance in the field of Criminal Justice System and attracting the attention of law-enforcement agencies, prosecutors and juries all over the world. The existing studies facilitated the researcher to define the objectives of the study, outline the research questions, formulate hypothesis and

construct the methodology to be pursued. It also aided in the statistical analysis of the findings.

After reviewing the previous studies the necessity of analyzing the fidelity of forensic evidence in Indian Criminal Justice system is felt, as ample studies are not done in Indian context. The present study is comprehensive study to analyze the role of forensic evidence at each stage of crime investigation, trial and verdict deliverance. This is the study carried out on Judgments delivered by court of Law, in which attempt is made to reveal each ambiguities related to forensic evidence and interaction among Police, Forensic laboratories and Court of Law, the three pillars of Criminal justice system, with special reference to forensic evidences.