

The Methods for Chart Reviews in Research on Emergency Medicine

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ABSTRACT:

Research in emergency medicine frequently makes use of medical chart reviews. However, the validity of the data extracted via chart reviews is rarely put under close scrutiny. This investigation's goal was to find out how many emergency medicine research articles use information from chart reviews and how many report case selection, abstractor training, monitoring and blinding, and interpreter agreement procedures. We found research publications that appeared in three emergency medicine journals between January 2018 and December 2021. We examined the papers that included chart reviews. In emergency medicine research, chart reviews are a typical way to collect data. However, it is typically lacking information on the data's quality. Higher methodological standards should be required for chart reviews, or the conclusions of these research may not be accurate.

Keywords: Methodological, biased, electrocardiogram, abstractor.

INTRODUCTION:

Reviews of medical records are commonly utilised to produce unique research in emergency care. However, despite the fact that medical records include crucial clinical information, they are not produced for research. There are no acknowledged standards for "well-conducted" chart reviews, although eight methodological approaches may improve the reliability, validity, and general calibre of information gleaned from clinical records. [1,2]

The purpose of this study was to ascertain the percentage of original research publications in emergency medical journals that use retrospective chart reviews to gather the majority or all of their data, as well as the percentage of articles that use the eight methodologies in chart reviews.

MATERIALS AND METHODS:

We retrieved original research publications from the American Journal of Emergency Medicine, Annals of Emergency Medicine, and Journal of Emergency Medicine, all of which were published between January 1, 2018, and December 31, 2021. The following were not included: case reports, letters, editorials, subject reviews, meta analyses, special theme articles, and symposium proceedings. The original research publications that relied exclusively or predominately on information from medical records to address the study's open-ended questions were classified as "chart reviews." Inpatient charts, paramedic reports, emergency department or other outpatient records, nursing notes, and other clinical data were all considered to be "medical records." Studies based on animal or laboratory research as well as those studies relying on death certificates, coroners' reports, or other public information were eliminated. Each article on chart reviews was thoroughly examined to determine whether or not it adhered to the methodologic standards for chart reviews mentioned in the Table. A "Yes" or "No" rating was given for each condition. Whether or not specifics were offered, credit was given if the writers cited the methodologic standard.

Two of the writers (EHG, DCB), who received training for this inquiry, were responsible for the selection and critical evaluation of the papers. Throughout the study, the entire research team met frequently to settle disagreements and uphold consistency in the selection and evaluation of each publication. Forms of standard abstraction were employed.

It was calculated what percentage of all original research articles used chart reviews and what percentage of those articles adhered to each of the eight criteria. With 95% confidence intervals, the findings are shown as percentages (CIs). To assess reliability, a second researcher conducted a blinded critical assessment of a random sample of 15% of the publications. The level of inter-rater agreement was assessed using the I-statistic. According to a preliminary study, between 4% and 35% of published medical record reviews in three journals of internal medicine followed different methodological guidelines for chart reviews.) It was determined that 200 chart review articles would be required to offer sufficient precision (95% CI limits of +6.6%) given the study's assumed adherence rate of 35%.

RESULTS:

The three peer-reviewed emergency medical journals published over 3,000 papers of various kinds over the course of the five years that ended on December 31, 2018. 986 of these were original research publications, and 244 of those (95% confidence interval [CI], 22% to 28%) used chart reviews to provide the majority or all of the crucial data. In 1991, there were 38 chart review papers (16%), whereas in 1990, there were 61 (25%) pieces. The Annals of Emergency Medicine published the vast majority (65.6%) of the chart review articles.

The percentage of articles that followed each chart abstraction criterion is shown in the Table. The majority of publications (73%; 95% CI, 67% to 79%) identified at least one of the

variables that were being examined, and the majority (98%; 95% CI, 96% to 99%) mentioned inclusion and exclusion criteria. The other chart review methods, however, had poor compliance. Only 12 papers (5%; 95% CI, 1% to 6%) referenced interrater dependability, and only one article (.r%; 95% CI, 0% to 2%) published a numerical measure of interrater agreement.

The information was examined to see if there were any differences in adherence between the three journals or over time. There were no major temporal patterns or statistically significant differences between the journals. An additional researcher looked at 37 randomly chosen articles. Seven of the methodologic criteria had 89% or higher agreement between the two abstractors, whereas variable definitions had a 68% agreement rate. The prevalence of negative replies (no adherence to each norm) was significantly higher than the prevalence of positive answers, which led to broad variations in the K-value. With limited possibility for agreement beyond chance, this extremely uneven distribution of replies placed a heavy burden on the c-statistic. [4]

DISCUSSION:

Medical chart reviews made for one-fourth of all scientific studies published in emergency medicine publications between 1989 and 1993. The current analysis, however, shows that most chart assessments lack acceptable methodology. Information is frequently gathered by unsupervised, poorly trained staff who may be aware of the study assumptions and group or treatment assignments. Most chart evaluations don't include whether their data can be replicated. In emergency medicine research, chart reviews might not always be reliable information sources. Medical records could not be appropriate as sources of scientific data for a variety of reasons. [5] Health experts sometimes disagree when interpreting histories, physical symptoms of disease, diagnostic procedures, and other clinical information in clinical practise. [6-9] the level of precision and detail with which clinicians record their observations varies as well. 5 In a recent research of [10] 9 trauma patients, Schwartz et al. found that there was typically little consistency between the information found in the patient's medical records and that learned through a personal interview. In one study, 27% of charts in an ambulatory care setting had no chief complaint. [11] 20% to 50% of aberrant test results are never recorded in patients' medical records, according to other studies. [12]

When data is taken out of medical records for a scientific inquiry, errors, inconsistencies, and omissions are exacerbated. Chart abstraction errors frequently result from missing charts, difficulty finding necessary data, multiple conflicting entries, ambiguous, incomplete, or illegible chart entries, inconsistent data coding into categories, handling ambiguous or missing data, and errors in data transcription from charts to computer databases. Furthermore, if chart abstractors are overly familiar with the study's assumptions or expectations, biased abstraction may result. [2,5]

Information derived from medical records is frequently inaccurate due to mistakes and inconsistencies in reading, interpreting, coding, and transcribing the data. If two abstractors searched the same medical record for the same data, their findings would frequently differ. Recent research has shown that key emergency medicine and trauma variables, such as the Glasgow Coma Scale scores, electrocardiogram results, medication histories, preventable deaths, procedures performed, standard coded discharge diagnoses, "outcome" and "appropriateness of care" measures, and adverse medical events, have poor inter-rater reliability. [7,13-16]

Medical records are essentially free-form diaries of observations, feelings, and suspicions. They largely consist of verbal descriptions of individuals and events, and it can be difficult to accurately translate these verbal descriptions into hard, quantifiable data. [5] There is currently little adherence to accepted chart review criteria in emergency medicine research. We anticipate that the findings of this study will make investigators and journal readers more aware of the issues with data derived from medical charts and will motivate them to include measures of data dependability in their reports. Reviews of medical records should adhere to strict methodological standards, just like laboratory experiments. The investigator typically selects the records and removes the data in whatever way he wishes, and he rarely reports specific details of his methods, Feinstein noted fifteen years ago. "The tactics of extracting data from medical records... [are] performed according to the laws of laissez faire," he said.

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