Online Journal of Public Health Informatics

Contents

Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Objective: To examine public health informatics (PHI) articles that are tagged with MeSH term "public health informatics" and to review the use of this MeSH term in recognizing the current state of PHI. Materials and Methods: MeSh term "public health informatics" was searched on MEDLINE-PubMed. The result of the search was screened in two steps. First, articles were included or excluded based on their titles and abstracts. Second, a full-text review was conducted to ensure the relevance of the included articles. All articles were charted based on public health focus, information technology, article type, and informatics concept. Results: 515 articles met the inclusion criteria. The majority of the articles focused on communicable disease monitoring, public health policy and research, and public health awareness. Syndromic surveillance and communication between clinical and public health units were dominant themes, while electronic registries and websites were the most popular information technologies applied in this field. Data collection, retrieval, and management were the most prevalent informatics concepts, and data security was the least researched concept. Discussion: PHI is a multi-disciplinary field with a wide range of themes, such as disease and injury surveillance, environmental monitoring, and research/policy utilization. MeSh term-tagged articles emphasized the need for further research in interoperability, data quality, appropriate data sources, accessible health information, and communication. Conclusion: Despite the rapid growth in PHI, improvements in interoperability, data quality, appropriate data sources, accessible health information and communication between stakeholders is needed to facilitate adequate implementation of PHI into the healthcare system.

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Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Background: Analyzing and visualizing health-related databases using Geographic Information Systems (GISs) becomes essential in controlling many public health problems. Objectives: To explore the perception and preferences of public health professionals (PHPs) about the usability of GISs in public health field Methods: For this scoping review, the investigators searched Medline Ovid, PubMed, IEEE, Scopus, and GeoBase databases. A total of 105 articles were identified. Nine articles met the inclusion criteria. Results: Iterative evaluations, training, and involvement of GIS end users are productive in GIS usability. More methodologies are needed to support the validity of GIS usability studies. The exchange of GIS technology impacts public health policy and research positively. Discussion: PHPs are aware of the use of GISs in the public health field, and the exchange of visualized health data in determining inequalities and inaccessibility issues. Conclusion: GISs are essential to control public health problems, if the related health datasets are analyzed carefully and if the mapping reports are extensively evaluated and interpreted. Keywords: Geographic Information systems, GIS, Public Health, Usability

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Abstract

Continuous quality improvement initiatives (CQII) in home visiting programs have traditionally occurred within a local implementing agency (LIA), parent organization, or funding provision. In Missouri, certain LIAs participate in the Missouri Maternal, Infant, and Early Childhood Home Visiting program (MIECHV). Their CQII activities and the coordination of CQI efforts across agencies are limited to quarterly meetings to discuss barriers to service delivery and newsletters. Their designed CQI process does not include evaluation of program fidelity or assessment nor supports to assist with identifying and prioritizing areas where improvement is needed. Therefore, much of LIA CQII are often lost to the benefit of external agencies facing similar challenges. We developed a virtual environment, the Missouri MIECHV Gateway, for CQII activities. The Gateway promotes and supports quality improvement for LIAs while aligning stakeholders from seven home visiting LIAs. Development of the Gateway environment aims to complement the existing MIECHV CQI framework by: 1) adding CQI elements that are missing or ineffective, 2) adding elements for CQI identification and program evaluation, and 3) offering LIAs a network to share CQI experiences and collaborate at a distance. This web-based environment allows LIA personnel to identify program activities in need of quality improvement, and guides the planning, implementation, and evaluation of CQII. In addition, the Gateway standardizes quality improvement training, collates overlapping resources, and supports knowledge translation, thus aimed to improve capacity for measurable change in organizational initiatives. This interactive web-based portal provides the infrastructure to virtually connect and engage LIAs in CQI and stimulate sharing of ideas and best practices. This article describes the characteristics, development, build, and launch of this quality improvement practice exchange virtual environment and present results of three usability pilot tests and the site launch. Briefly, prior to deployment to 58 users, usability pilot testing of the site occurred in three stages, to three defined groups. Pilot testing results were overall positive, desirable, and vital to improving the site prior to the full-launch. The majority of reviewers stated they would access and use the learning materials (87%), use the site for completing CQII (80%), and reported that the site will benefit their work teams in addressing agency challenges (66%). The majority of reviewers also approved of the developed fidelity assessment: as, easy to use (79%), having a clear purpose (86%), providing value in self-identification of CQII (75%), and recommendations were appropriate (79%). The System Usability Scale (SUS) score increased (10%) between pilot groups 2 and 3, with a mean SUS score of 71.6, above the U.S. average of 68. The site launched to 60 invited users; the majority (67%) adopted and used the site. Site stability was remarkable (6 total minutes of downtime). The site averaged 29 page views per day.

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Abstract

Background: Infectious diseases can appear and spread rapidly. Timely information about disease patterns and trends allows public health agencies to quickly investigate and efficiently contain those diseases. But disease case reporting to public health has traditionally been paper-based, resulting in somewhat slow, burdensome processes. Fortunately, the expanding use of electronic health records and health information exchanges has created opportunities for more rapid, complete, and easily managed case reporting and investigation. To assess how this new service might impact the efficiency and quality of a public health agency"s case investigations, we compared the timeliness of usual case investigation to that of case investigations based on case report forms that were partially pre-populated with electronic data. Intervention: Between September 2013-March 2014, chlamydia disease report forms for certain clinics in Indianapolis were electronically pre-populated with clinical, lab and patient data available through the Indiana Health Information Exchange, then provided to the patient's doctor. Doctors could then sign the form and deliver it to public health for investigation and population-level disease tracking. Methods: We utilized a novel matched case analysis of timeliness changes in receipt and processing of communicable disease report forms. Each Chlamydia cases reported with the pre-populated form were matched to cases reported in usual ways. We assessed the time from receipt of the case at the public health agency: 1) inclusion of the case into the public health surveillance system and 2) to close to case. A hierarchical random effects model was used to compare mean difference in each outcome between the target cases and the matched cases, with random intercepts for case. Results: Twenty-one Chlamydia cases were reported to the public health agency using the pre-populated form. Sixteen of these pre-populated form cases were matched to at least one other case, with a mean of 23 matches per case. The mean Reporting Lag for the pre-populated form cases was 2.5 days, which was 2.7 days shorter than the mean Reporting Lag for the matched controls (p = <0.001). The mean time to close a pre-populated form case was 4.7 days, which was 0.2 days shorter than time to close for the matched controls (p = 0.792). Conclusions: Use of pre-populated forms significantly decreased the time it took for the local public health agency to begin documenting and closing chlamydia case investigations. Thoughtful use of electronic health data for case reporting may decrease the per-case workload of public health agencies, and improve the timeliness of information about the pattern and spread of disease.

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Abstract

Objective: Maternal and neonatal mortality is high in sub-Saharan Africa. To support Healthcare Workers (HCWs), a computerized decision support system (CDSS) was piloted at six rural maternal care units in Burkina Faso. During the two years of the study period, it was apparent from reports that the CDSS was not used regularly in clinical practice. This study aimed to explore the reasons why HCWs failed to use the CDSS. Methods: A workshop, organised as group discussions and a plenary session, was performed with 13 participants to understand their experience with the CDSS and suggest improvements if pertinent. Workshop transcripts were analysed thematically. Socio-demographic and usage patterns of the CDSS were examined by a questionnaire and analysed descriptively. Results: The participants reported that the contextual basic conditions for using the CDSS were not fulfilled. These included unreliable power supply, none user-friendly partograph, the CDSS was not integrated with workflow and staff lacked motivational incentives. Despite these limitations, the HCWs reported learning benefits from guidance and alerts in the CDSS. Using the CDSS enabled them to discover problems earlier as they learned to focus on symptoms to prevent harmful situations. Conclusion: The CDSS was not tailored to the needs and context of the users. The HCWs, defined their needs and suggested how the CDSS should be re-designed. This suggests that the successful and regular usage of any CDSS in rural settings requires the involvement of users throughout the construction and pilot-testing phases and not only during the early prototype design period.

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Abstract

Prescription opioid pain medication overuse, misuse and abuse has been a significant contributing factor in the opioid epidemic. The rising death rates from opioid overdose has caused healthcare practitioners and researchers to work on optimizing pain therapy and limiting the prescriptions for pain medications. The state of New York has implemented a prescription drug monitoring program(PDMP), amended public health law to limit the prescription of opioids for acute pain and utilized the resources of the state and county health departments to help in curbing this epidemic. The recent publication of guidelines for prescription opioids from CDC [2] and ASIPP (American Society of Interventional pain practitioners) [4] have independently reviewed literature and found good evidence of limiting opioid prescription for acute and chronic non cancer pain. Method Clinical Decision Support Systems (CDSS) have been developed over the last decade to help in the work flow of healthcare providers since advanced technology is increasing the complexity of electronic health records systems. There are several systematics reviews on the effectivity and utility of CDSSs. The common consensus seems to be that commercially and locally developed CDSS are effective in improving patient measures while actual workload improvement and efficient cost cutting measure are not significantly improved by CDSS. Patient provider involvement in developing CDSS is a determinant of its success and utilization rates. In this light, a plug and play form of CDSS which is independent of the vendors of Electronic Health Records and can be implemented from an external platform through secure channels would be more effective. The Health Level Seven's (HL7) open licensed interoperability standard called Fast Health Interoperability Resources (FHIR) has a platform, Substitutable Medical Applications and Reusable Technologies (SMART) for CDSS app development by a third party. (Mandl and Kohane) [13] We adopted these open source standard to develop an app for proper implementation of the recently published guidelines for management of pain with opioid pain medications. The goal for this CDSS tool would be to achieve proper monitoring of prescription drugs, patients' medication list and potential interactive medications, surveillance for abuse/ misuse, patient involvement in alternative therapy, reporting problems and obtaining adequate pain control.

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Abstract

Purpose: The purpose of this study is to examine the use of interactive visualizations to represent data/information related to social determinants of health and public health indicators, and to investigate the benefits of such visualizations for health policymaking. Methods: The study developed a prototype for an online interactive visualization tool that represents the social determinants of health. The study participants explored and used the tool. The tool was evaluated using the informal user experience evaluation method. This method involves the prospective users of a tool to use and play with it and their feedback to be collected through interviews. Results: Using visualizations to represent and interact with health indicators has advantages over traditional representation techniques that do not allow users to interact with the information. Communicating healthcare indicators to policymakers is a complex task because of the complexity of the indicators, diversity of audiences, and different audience needs. This complexity can lead to information misinterpretation, which occurs when users of the health data ignore or do not know why, where, and how the data has been produced, or where and how it can be used. Conclusions: Public health policymaking is a complex process, and data is only one element among others needed in this complex process. Researchers and healthcare organizations should conduct a strategic evaluation to assess the usability of interactive visualizations and decision support tools before investing in these tools. Such evaluation should take into consideration the cost, ease of use, learnability, and efficiency of those tools, and the factors that influence policymaking.

Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Objective The objective was to forecast and validate prediction estimates of influenza activity in Houston, TX using four years of historical influenza-like illness (ILI) from three surveillance data capture mechanisms. Background Using novel surveillance methods and historical data to estimate future trends of influenza-like illness can lead to earlier detection of influenza activity increases and decreases. Anticipating surges gives public health professionals more time to prepare and increase prevention efforts. Methods Data was obtained from three surveillance systems, Flu Near You, ILINet, and hospital emergency center (EC) visits, with diverse data capture mechanisms. Autoregressive integrated moving average (ARIMA) models were fitted to data from each source for week 27 of 2012 through week 26 of 2016 and used to forecast influenza-like activity for the subsequent 10 weeks. Estimates were then compared to actual ILI percentages for the same period. Results Forecasted estimates had wide confidence intervals that crossed zero. The forecasted trend direction differed by data source, resulting in lack of consensus about future influenza activity. ILINet forecasted estimates and actual percentages had the least differences. ILINet performed best when forecasting influenza activity in Houston, TX. Conclusion Though the three forecasted estimates did not agree on the trend directions, and thus, were considered imprecise predictors of long-term ILI activity based on existing data, pooling predictions and careful interpretations may be helpful for short term intervention efforts. Further work is needed to improve forecast accuracy considering the promise forecasting holds for seasonal influenza prevention and control, and pandemic preparedness.

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