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Contents

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

Abstract

Objective: To categorize and describe the public health informatics (PHI) and global health informatics (GHI) literature between 2012 and 2014. Methods: We conducted a semi-systematic review of articles published between January 2012 and September 2014 where information and communications technologies (ICT) was a primary subject of the study or a main component of the study methodology. Additional inclusion and exclusion criteria were used to filter PHI and GHI articles from the larger biomedical informatics domain. Articles were identified using MEDLINE as well as personal bibliographies from members of the American Medical Informatics Association PHI and GHI working groups. Results: A total of 85 PHI articles and 282 GHI articles were identified. While systems in PHI continue to support surveillance activities, we identified a shift towards support for prevention, environmental health, and public health care services. Furthermore, articles from the U.S. reveal a shift towards PHI applications at state and local levels. GHI articles focused on telemedicine, mHealth and eHealth applications. The development of adequate infrastructure to support ICT remains a challenge, although we observed a small but growing set of articles that measure the impact of ICT on clinical outcomes. Discussion: There is evidence of growth with respect to both implementation of information systems within the public health enterprise as well as a widening of scope within each informatics discipline. Yet the articles also illuminate the need for more primary research studies on what works and what does not as both searches yielded small numbers of primary, empirical articles. Conclusion: While the body of knowledge around PHI and GHI continues to mature, additional studies of higher quality are needed to generate the robust evidence base needed to support continued investment in eHealth by governmental health agencies.

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

Abstract

Pharmacovigilance (PV) plays a key role in the healthcare system through assessment, monitoring and discovery of interactions amongst drugs and their effects in human. Pharmaceutical and biotechnological medicines are designed to cure, prevent or treat diseases; however, there are also risks particularly adverse drug reactions (ADRs) can cause serious harm to patients. Thus, for safety medication, ADRs monitoring required for each medicine throughout its life cycle, during development of drug such as pre-marketing including early stages of drug design, clinical trials, and post-marketing surveillance. PV is concerns with the detection, assessment, understanding and prevention of ADRs. Pharmacogenetics and pharmacogenomics are an indispensable part of the clinical research. Variation in the human genome is a cause of variable response to drugs and susceptibility to diseases are determined, which is important for early drug discovery to PV. Moreover, PV has traditionally involved in mining spontaneous reports submitted to national surveillance systems. The research focus is shifting toward the use of data generated from platforms outside the conventional framework such as electronic medical records, biomedical literature, and patient-reported data in health forums. The emerging trend in PV is to link premarketing data with human safety information observed in the post-marketing phase. The PV system team obtains valuable additional information, building up the scientific data contained in the original report and making it more informative. This necessitates an utmost requirement for effective regulations of the drug approval process and conscious pre and post approval vigilance of the undesired effects, especially in India. Adverse events reported by PV system potentially benefit to the community due to their proximity to both population and public health practitioners, in terms of language and knowledge, enables easy contact with reporters by electronically. Hence, product safety PV helps to the patients get well, and to manage optimally, or ideally avoid, illness is a collective responsibility of industry, drug regulators, and clinicians and other healthcare professionals. This review summarized objectives and methodologies used in PV with critical overview of existing PV in India, challenges to overcome and future prospects with respect to Indian context. Keywords: Pharmacovigilance; Adverse drug reaction; Clinical trials; Pharmacogenomics; Data mining; Indian Pharmacopoeia Commission

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

Abstract

The collaboration of public health education and information technology has made patient care safer and more reliable than before. Nurses and doctors use handheld computers to record a patient"s medical history and check that they are administering the correct treatment. Fortunately Public Health Informatics (PHI) is the intersecting point of technology and public health. Therefore, the inclusion of online medical and epidemiology databases in the course curriculum of budding medical professionals and postgraduate students would be beneficial in enhancing the quality of health care, extensive epidemiological research, health education, health policies, health planning and consumer satisfaction as well. The purpose of this article is to discuss and provide introduction of various databases which have huge information and it could be used to enhance the public health education. Keywords: Information Technology, Public Health Informatics, Public Health Education, Databases.

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

Abstract

Smartphone technology is nascent compared to other technologies; however, it has shown an unprecedented uptake amongst lay consumers and professionals. This article presents the history, components, and key features of smartphones, as well as their related concepts and how they work, and it also delineates the process of smartphone applications (apps) development and publishing in the app stores. It also describes and discusses smartphone technology utilisation for health consumers, healthcare professionals, and health researchers, as well as the regulations of health-related apps.

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

Abstract

Objective Evidence-based sets of medical orders for the treatment of patients with common conditions have the potential to induce greater efficiency and convenience across the system, along with more consistent health outcomes. Despite ongoing utilization of order sets, quantitative evidence of their effectiveness is lacking. In this study, conducted at Advocate Health Care in Illinois, we quantitatively analyzed the benefits of community acquired pneumonia order sets as measured by mortality, readmission, and length of stay (LOS) outcomes. Methods In this study, we examined five years (2007–2011) of computerized physician order entry (CPOE) data from two city and two suburban community care hospitals. Mortality and readmissions benefits were analyzed by comparing "order set" and "no order set" groups of adult patients using logistic regression, Pearson's chi-squared, and Fisher's exact methods. LOS was calculated by applying one-way ANOVA and the Mann-Whitney U test, supplemented by analysis of comorbidity via the Charlson Comorbidity Index. Results The results indicate that patient treatment orders placed via electronic sets were effective in reducing mortality [OR=1.787; 95% CF 1.170-2.730; P=.061], readmissions [OR=1.362; 95% CF 1.015-1.827; P=.039], and LOS [F (1,5087)=6.885, P=.009, 4.79 days (no order set group) vs. 4.32 days (order set group)]. Conclusion Evidence-based ordering practices have the potential to improve pneumonia outcomes through reduction of mortality, hospital readmissions, and cost of care. However, the practice must be part of a larger strategic effort to reduce variability in patient care processes. Further experimental and/or observational studies are required to reduce the barriers to retrospective patient care analyses. Keywords: evidence-based medicine, medication order sets, health outcomes research, pneumonia, computerized physician order entry (CPOE).

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

Abstract

Integration of disparate information from electronic health records, clinical data warehouses, birth certificate registries and other public health information systems offers great potential for clinical care, public health practice, and research. Such integration, however, depends on correctly matching patient-specific records using demographic identifiers. Without standards for these identifiers, record linkage is complicated by issues of structural and semantic heterogeneity. Objectives: Our objectives were to develop and validate an ontology to: 1) identify components of identity and events subsequent to birth that result in creation, change, or sharing of identity information; 2) develop an ontology to facilitate data integration from multiple healthcare and public health sources; and 3) validate the ontology's ability to model identity-changing events over time. Methods: We interviewed domain experts in area hospitals and public health programs and developed process models describing the creation and transmission of identity information among various organizations for activities subsequent to a birth event. We searched for existing relevant ontologies. We validated the content of our ontology with simulated identity information conforming to scenarios identified in our process models. Results: We chose the Simple Event Model (SEM) to describe events in early childhood and integrated the Clinical Element Model (CEM) for demographic information. We demonstrated the ability of the combined SEM-CEM ontology to model identity events over time. Conclusion: The use of an ontology can overcome issues of semantic and syntactic heterogeneity to facilitate record linkage.

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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: Studies evaluating development of health information systems in developing countries are limited. Most of the available studies are based on pilot projects or cross-sectional studies. We took a longitudinal approach to analysing the development of Botswana’s health information systems. Objectives: We aimed to: (i) trace the development of the national health information systems in Botswana (ii) identify pitfalls during development and prospects that could be maximized to strengthen the system; and (iii) draw lessons for Botswana and other countries working on establishing or improving their health information systems. Methods: This article is based on data collected through document analysis and key informant interviews with policy makers, senior managers and staff of the Ministry of Health and senior officers from various stakeholder organizations. Results: Lack of central coordination, weak leadership, weak policy and regulatory frameworks, and inadequate resources limited development of the national health information systems in Botswana. Lack of attention to issues of organizational structure is one of the major pitfalls. Conclusion: The ongoing reorganization of the Ministry of Health provides opportunity to reposition the health information system function. The current efforts including development of the health information management policy and plan could enhance the health information management system. Keywords: Disease outbreaks, electronic health records/classification, machine learning, natural language processing, public health informatics, public health surveillance/methods

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

Abstract

Objectives: Diabetes mellitus is a public health concern worldwide. TeleHealth technology may be an effective tool for empowering patients in the self-management of diabetes mellitus. However despite the great impact of diabetes on healthcare in Saudi Arabia, no research has investigated diabetic patients' willingness to use this technology. This study investigates diabetic patients' willingness to use tele-technology as a tool to monitor their disease. Methods: Data were collected from diabetic patients attending the diabetes education clinic at the Ministry of National Guard Health Affairs (MNGHA) in the Eastern region of Saudi Arabia over a three month period. A survey was developed which measured patients' willingness to use tele-technology in the self-management of their diabetes as well as their perceived expectations from the technology. Results: The study found that the majority of patients were willing to use tele-technology to self- monitor their diabetes. However, a minority (11.3%) indicated willingness to use the system daily and only half indicated preference to use it once a week (53.8%). Patients who were younger, had higher education levels, were employed, had internet access and had Type II diabetes were significantly more likely to report willingness to use the technology. Conclusions: Diabetic patients could be ready to play a more active role in their care if given the opportunity. Results from this study could serve as a baseline for future studies to develop targeted interventions by trialing tele-technology on a sample of the diabetic population. Patients with diabetes need to be in charge of their own care in order to improve health outcomes across the country. Keywords: diabetes, self-management, tele-technology, willingness. Abbreviations: Ministry of National Guard Health Affairs (MNGHA), Kingdom of Saud Arabia (KSA)

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

Abstract

Cancer registry data collection involves, at a minimum, collecting data on demographics, tumor characteristics, and treatment. A common, identified, and standardized set of data elements is needed to share data quickly and efficiently with consumers of this data. This project highlights the fact that, there is a need to develop common data elements; Surveys were developed for central cancer registries (CCRs) and cancer researchers (CRs) at NCI-designated Cancer Centers, in order to understand data needs. Survey questions were developed based on the project focus, an evaluation of the research registries and database responses, and systematic review of the literature. Questions covered the following topics: 1) Research, 2) Data collection, 3) Database/ repository, 4) Use of data, 5) Additional data items, 6) Data requests, 7) New data fields, and 8) Cancer registry data set. A review of the surveys indicates that all cancer registries' data are used for public health surveillance, and 96% of the registries indicate the data are also used for research. Data are available online in interactive tables from over 50% of CRs and 87% of CCRs. Some other survey responses indicate that CCR treatment data are not complete for example treatment data, however cancer researchers are interested in treatment variables from CCRs. Cancer registries have many data available for review, but need to examine what data are needed and used by different entities. Cancer Registries can further enhance usage through collaborations and partnerships to connect common interests in the data by making registries visible and accessible. Keywords: Public Health; Disease Registries; Disease Reporting

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

Abstract

Surveillance of rare diseases in children is an important aspect of public health. Rare diseases affect thousands of children worldwide. The Canadian Paediatric Surveillance Program (CPSP) has been in existence since 1996, and provides an innovative means to undertake paediatric surveillance and increase awareness of childhood disorders that are high in disability, morbidity, mortality, and economic costs to society, despite their low frequency. Traditionally, CPSP used manual paper-based reporting on a monthly basis, which although had an impressive response rate, it had inherent longer processing times and costs associated with it. The article below describes an innovative web-based system that enables seamless reporting from participants across the country providing a quick, reliable and simple mechanism for the users to submit data while yielding better data quality, timeliness and increased efficiencies. The development of such a system represents a significant advancement in the public health informatics area, building capacity for seamless and rapid data management for national surveillance.

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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: Virtual Communities of Practice (CoPs) are flexible communication and knowledge management tools enabling collaboration, sharing of best practice and professional development. There have been few studies that have looked at the use and usefulness of virtual CoPs in public health. Methods: This project sought to gather the evidence and develop recommendations for the value of virtual CoPs in public health through a literature review, and through piloting two CoPs in obesity. The research aimed to answer how useful CoPs are in obesity prevention, what makes a CoP successful and what evaluation methods are appropriate. Results: CoPs are composed of observers, passive and active contributors with a small group of 'super-users'. All users learn through reading and listening, even if they do not post. The CoPs had higher levels of reading activity as opposed to low levels of posting activity. Longer existence of CoPs usually means more active membership. There are complex reasons why users fail to engage in knowledge sharing. Success of a CoP is creating an online environment where users feel comfortable. CoPs need administrative support and facilitation. Champions play a vital role. Conclusions: Evidence shows some encouraging results about the value of CoPs in enabling collaboration and information sharing. Despite low membership numbers of the obesity CoPs piloted, members see value and suggest improvements. Findings suggest that success comes from leadership, champions, and larger networks with more posting activity. Mixed methods of quantitative and qualitative research are appropriate in measuring the use and impact of, CoPs. Keywords: Communities of practice, public health, obesity, online networks, knowledge translation Abbreviations: Public Health England (PHE), Community of Practice (CoP), UK Health Forum (UKHF), Obesity Learning Centre (OLC), NCMP – National Child Measurement Programme

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

Abstract

Objective Electronic laboratory reporting has been promoted as a public health priority. The Office of the U.S. National Coordinator for Health Information Technology has endorsed two coding systems: Logical Observation Identifiers Names and Codes (LOINC) for laboratory test orders and Systemized Nomenclature of Medicine-Clinical Terms (SNOMED CT) for test results. Materials and Methods We examined LOINC and SNOMED CT code use in electronic laboratory data reported in 2011 by 63 non-federal hospitals to BioSense electronic syndromic surveillance system. We analyzed the frequencies, characteristics, and code concepts of test orders and results. Results A total of 14,028,774 laboratory test orders or results were reported. No test orders used SNOMED CT codes. To describe test orders, 77% used a LOINC code, 17% had no value, and 6% had a non-informative value, “OTH”. Thirty-three percent (33%) of test results had missing or non-informative codes. For test results with at least one informative value, 91.8% had only LOINC codes, 0.7% had only SNOMED codes, and 7.4% had both. Of 108 SNOMED CT codes reported without LOINC codes, 45% could be matched to at least one LOINC code. Conclusion Missing or non-informative codes comprised almost a quarter of laboratory test orders and a third of test results reported to BioSense by non-federal hospitals. Use of LOINC codes for laboratory test results was more common than use of SNOMED CT. Complete and standardized coding could improve the usefulness of laboratory data for public health surveillance and response.

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

Abstract

Objective: To bridge gaps identified during the 2009 H1N1 influenza pandemic by developing a system that provides public health departments improved capability to manage and track medical countermeasures at the state and local levels and to report their inventory levels to the Centers for Disease Control and Prevention (CDC). Materials and Methods: The CDC Countermeasure Tracking Systems (CTS) program designed and implemented the Inventory Management and Tracking System (IMATS) to manage, track, and report medical countermeasure inventories at the state and local levels. IMATS was designed by CDC in collaboration with state and local public health departments to ensure a "user-centered design approach." A survey was completed to assess functionality and user satisfaction. Results: IMATS was deployed in September 2011 and is provided at no cost to public health departments. Many state and local public health departments nationwide have adopted IMATS and use it to track countermeasure inventories during public health emergencies and daily operations. Discussion: A successful response to public health emergencies requires efficient, accurate reporting of countermeasure inventory levels. IMATS is designed to support both emergency operations and everyday activities. Future improvements to the system include integrating barcoding technology and streamlining user access. To maintain system readiness, we continue to collect user feedback, improve technology, and enhance its functionality. Conclusion: IMATS satisfies the need for a system for monitoring and reporting health departments' countermeasure quantities so that decision makers are better informed. The "user-centered design approach" was successful, as evident by the many public health departments that adopted IMATS.

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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: In Nigeria, one of the major challenges associated with evidence-to-policy link in the control of infectious diseases of poverty (IDP), is the deficient information literacy capacity among policymakers. There is need for policymakers to develop capacity to discover relevant information, accurately evaluate retrieved information and to apply it correctly. Objectives: To use information literacy tool of International Network for Availability of Scientific Publications (INASP) to enhance policymakers' capacity for policymaking on control of IDP in Nigeria. Methods: Modified "before and after" intervention study design was used in which outcomes were measured on target participants both before the intervention is implemented and after. This study was conducted in Ebonyi State, south-eastern Nigeria and participants were career health policy makers. A two-day health-policy information literacy training workshop was organized to enhance participants' information literacy capacity. Topics covered included: introduction to information literacy; defining information problem; searching for information online; evaluating information; science information; knowledge sharing interviews; and training skills. Results: A total of 52 policymakers attended the workshop. The pre-workshop mean of knowledge and capacity for information literacy ranged from 2.15-2.97, while the post-workshop mean ranged from 3.34-3.64 on 4point scale. The percentage increase in mean of knowledge and capacity at the end of the workshop ranged from 22.6%-55.3%. Conclusion: The results of this study suggest that through information literacy training workshop policy makers can acquire the capacity to identify, capture and share the right kind of information in the right contexts to influence relevant action or a policy decision. Key Words: Policymakers, information literacy, capacity, infectious diseases of poverty, workshop

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