

A Narrative Review of Influenza Educational Interventions for Adult Patients who Attend the Emergency Department

Sheree MS Smith^{1,2*}, Sandra Sonogo¹, Allen C Cheng³, Gwenyth R Wallen⁴, Grant Waterer⁵ and Philip Thompson^{6,7,8}

¹School of Nursing and Midwifery, Western Sydney University, Penrith, Australia

²Respiratory, Sleep and Environmental Health Research Academic Unit, South West Sydney Local Health District, Liverpool, Sydney, Australia

³Department of Epidemiology and Preventative Medicine, Faculty of Medicine, Nursing and Health Sciences, Monash University, Melbourne, Australia

⁴National Institutes of Health, Clinical Center, Bethesda, Maryland, USA

⁵School of Medicine and Pharmacology, Royal Perth Unit, University of Western Australia, Perth, Australia

⁶The Lung Health Clinic, Hollywood Hospital, Perth, Australia

⁷School of Medicine and Pharmacology, Queen Elizabeth II Unit, University of Western Australia, Perth, Australia

⁸Department of Respiratory Medicine, Sir Charles Gairdner Hospital, Perth, Australia

*Corresponding author: Sheree MS Smith, School of Nursing and Midwifery, Western Sydney University, Locked Bag 1797, Penrith Sydney, NSW 2751 Australia, Tel: +61-2-46203532; E-mail: sheree.smith@westernsydney.edu.au

Received date: 27 Jun 2016; Accepted date: 03 Aug 2016; Published date: 08 Aug 2016.

Citation: Smith SMS, Sonogo S, Cheng AC, Wallen GR, Waterer G, et al. (2016) A Narrative Review of Influenza Educational Interventions for Adult Patients who Attend the Emergency Department. *J Infect Pulm Dis* 2(2): doi <http://dx.doi.org/10.16966/2470-3176.116>

Copyright: © Smith SMS, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Background: Influenza is associated with serious health impacts including mortality, morbidity, and increased health care utilisation. Emergency departments (ED) have increased influenza presentations every year and education has been proven to reduce ED re-attendances and evidence for ED influenza Education Interventions (EI) is unclear.

Method: Peer-reviewed literature conducted in English language listed on health and medical electronic databases were assessed. The initial review of ED influenza EIs for adult patients was an empty review. We expanded the review to all influenza EI in any setting such as public health. The primary search was completed in 2014 and 2015 and expanded search were performed in January 2016 using keywords that included, amongst many others, influenza, emergency department, patient education, and self-care. Reference lists of relevant articles were also screened. Standard requirements for literature review assessments were followed and a narrative review was conducted.

Results: The database search yielded 452 potentially relevant studies and no eligible studies found. A narrative review reports ED influenza ED organisation plans, influenza patient education and implications for influenza self-care.

Conclusion: This literature review revealed no eligible published studies to support current influenza educational activities or educational interventions that could be used in emergency departments and public health initiatives. There are informal and government sources of influenza information however the efficacy of the influenza information in supporting self-care could not be determined.

Keywords: Emergency department; Epidemic; Pandemic; Influenza; Education; Public health

Introduction

Seasonal and pandemic influenza outbreaks are associated with serious adverse health impacts worldwide, including morbidity, mortality, and increased healthcare utilisation [1,2]. Typically seasonal influenza affects an estimated 2 to 5 million people annually, and influenza-associated illnesses cause 250,000 to 500,000 deaths per year globally [2,3]. Moreover, emergence of novel viral strains poses a continual and unpredictable threat of a global influenza pandemic and the possibility of significant public health and economic outcomes [4,5]. During influenza epidemics and pandemics, the Emergency Department (ED) is a primary point of engagement between health care systems, health professionals, and people with influenza-like illness (ILI). The association between influenza outbreaks and ED crowding has been previously confirmed by numerous studies [6-8]. EDs are also an important data source for viral outbreak monitoring, surveillance, and early detection. Syndromic surveillance of ILI in EDs is currently conducted worldwide [9]. A recent study

determined the impact of influenza on EDs in Ontario, Canada between the years 2003-2010 [10] and concluded there were between 500 and 1000 presentations per 100,000 population per year. In Australia, a 5-year study of 27 public EDs showed that influenza ED presentations had increased every year and there was a significant surge during the 2009 pandemic, resulting in increased hospitalisations and access block to hospital beds [11]. In the United States of America (USA), a study of rapid testing for influenza found that over 80% of patients with influenza and influenza like illness (ILI) were discharged home from the ED [12]. Influenza education will be important in supporting patients discharged from the ED to enable them to self-manage symptoms and limit the spread of the infection at home.

The Australasian College for Emergency Medicine (ACEM) [13] and the American College of Emergency Physicians (ACEP) [14] have well described organisational plans and clinical algorithms for the management of seasonal and pandemic influenza and the procedures

revolve around the structural and functional aspects of the ED when there are increases in influenza patient presentations. They also outline the influenza reporting mechanisms to various health authorities. The ACEM influenza management plan provides information for clinical management, communication between health care workers and workforce education and equipment needs and clearly states “ED is responsible for treating severely ill patients as well as low-acuity ILI patients” [13]. In both the Australian and American emergency plans patient education is briefly mentioned and national information services from the Australian Department of Health and Centers for Disease Control and Prevention (CDC) websites are noted [15,16].

The scope of care provide by ED staff is broad, from acute assessment and management of people with a multitude of physical and psychological problems in a pressurised environment that frequently comprises managing large patient volumes often with limited resources [17-19]. Consequently, public health agencies are concerned that EDs may not be able to cope with future influenza epidemics/pandemics and are keen to see interventions that reduce influenza related re-attendance developed, thereby ensuring quality care and potentially impacting on ED overcrowding [20,21]. There is evidence that patient education in clinical practice improves patient outcomes and these interventions [22-25] have been successful in the ED. Pharmaceutical interventions such as vaccinations and anti-viral drugs remain the most heavily supported interventions for influenza pandemic preparedness. However these have their limits and consideration of EIs in the ED is an important intervention to consider. Evidenced based education could promote both pharmaceutical [26] and non-pharmaceutical [27-31] aspects of influenza care, as the ED provides an opportunistic patient education setting. Prior to considering implementation of influenza educational interventions (IEI) in the ED, it was important to assess the available evidence that influenza education improved self-care. Our primary aim was to conduct a systematic review of IEI in the ED. With paucity of literature we instead conducted a narrative review of ED organisational plans in relation to the provision of patient education, influenza patient education and implications for influenza self-care that we were able to identify through the searches. In the interest of full disclosure we have outlined our primary intent.

Methods

The first objective of this review was to identify and evaluate the emergency department influenza educational interventions (IEI) for adults published literature and to assess the evidence for the education intervention's efficacy in terms of influenza self-care. The review of IEI in the ED resulted in what is described by Yaffe et al. [32] as an empty review and a second objective was formalised and expanded the review to any influenza educational symptom self-care intervention for adults irrespective of setting.

Search strategy and study selection criteria

An initial review protocol was developed concordant with the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guideline and updated to include the second objective [33]. An explicit search strategy was devised to identify relevant literature, and a search of peer-reviewed literature conducted in the English language on the following electronic databases: Medline, Pubmed, Cochrane, CINAHL, Embase, Scopus, Scencedirect, and Google Scholar. The primary search was completed in 2014 and 2015 and expanded search were performed in January 2016, using combinations of keywords and their abbreviations: “influenza”, “flu”, “H1N1”, “H5N1”, “emergency”, “emergency department”, “emergency room”, “emergency service”, “emergency medicine”, “patient education”, “educational intervention”, “health promotion”, “education

program”, “public health campaign”, “booklet”, “brochure”, “advice”, “book”, “leaflet”, “pamphlet”, “instructions”, “self-care”. The search was not restricted to any publication timeframe. Additionally, the reference lists of relevant articles were screened for potential inclusion articles.

The review protocol restricted the search to randomised and non-randomised study designs that included adult participants attending the ED for influenza-like illness (ILI) as delineated by the Centers for Disease Control and Prevention (CDC) case definition [34] of a fever of 100 degrees Fahrenheit (37.8°C) or greater and a cough and/or a sore throat in the absence of a known cause other than influenza, and reported a comparison group. In the primary search IEIs were included if they were administered either while attending the ED, upon discharge, or within one week from attending the ED. Our expanded search included influenza educational interventions for adults in any setting. IEI formats that were considered were verbal, written, printed, demonstrations, visual, and auditory. The outcome of interest was the occurrence of influenza education and its effect on influenza self-care. The protocol outlined the process where titles and abstracts were identified according to agreed search criteria and refinement to the search strategy after first reviewing the abstracts could occur. For those abstracts that potentially met the criteria, full text manuscripts were sought and reviewed. Collecting and collating published data was pre-determined by the reviewers prior to the commencement of the study.

Study selection and data extraction

Collecting and collating published data was pre-determined by the reviewers prior to the commencement of the study. A protocol outlined the process for identifying titles and abstracts using agreed search criteria as well as defining the search strategy to follow. For abstracts that met the criteria, full text manuscripts were to be sought and reviewed. The literature review was performed by two independent reviewers (SMS, SS) and was aided by a pre-designed data extraction spreadsheet. Disagreements over inclusion articles were settled through discussion until consensus was reached, or resolved by an independent arbitrator.

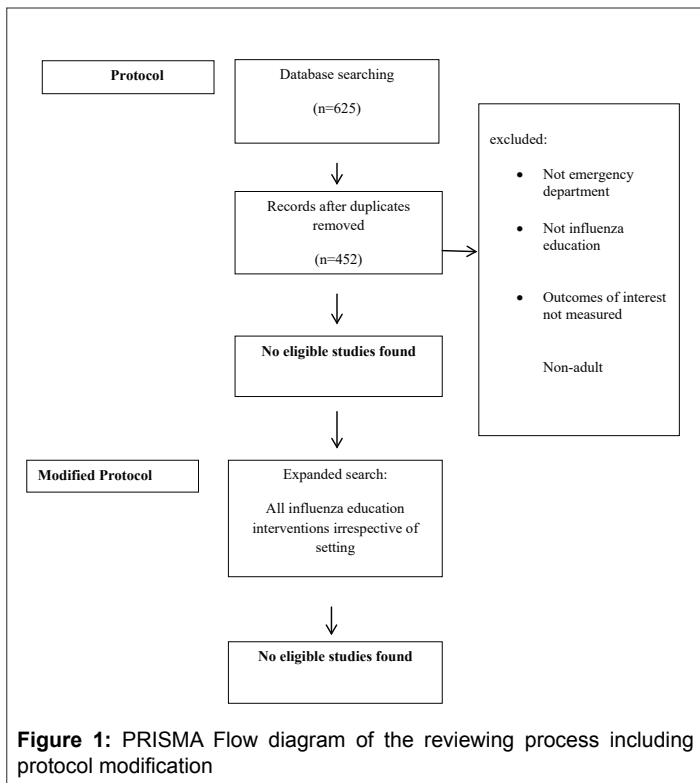
Quality assessment

For identified manuscripts their quality was to be assessed using the Critical Appraisal Skills Programme (CASP) tools [35] for reporting bias and the Scottish Intercollegiate Guidelines Network (SIGN) check lists [36] for methodological quality. These allow assessment for the standard risk of bias domains; random sequence generation, allocation concealment, attribution bias, selective reporting, and blinding.

Differences between protocol and review

Complete implementation of the initial review protocol was not possible due to a lack of published studies meeting the criteria at the review stage. The lack of studies was independently confirmed by two investigators (SMS, SS) and the planned data extraction from study reports could not be undertaken. Furthermore any studies that are underway *via* the clinical trial registration portal [37] were also sought however none were found.

In the absence of eligible studies addressing the primary objective, a secondary objective of a narrative review of influenza education for adults was implemented with an updated search of influenza interventions for adults in any setting. This objective consisted of the identification and classification of the retrieved data into relevant key topics that could generate informative observations. These topic areas form a report that describes the service for influenza patients who attend the emergency department pandemic influenza strategic plans and influenza patient education. Figure 1 shows the flow of the review process.



Results and Discussion

The database search initially yielded 452 potentially relevant studies. Review of these studies revealed no eligible studies evaluated the effectiveness of IEs for adults attending the emergency department. This central finding suggests an empty review as described by Yaffe et al. [32] and indicates substantial paucity of literature on this topic. Therefore a narrative review of the service for influenza patients who attended the ED in the context of seasonal and pandemic influenza plans is provided here as part of the discussion with the intent that it may serve to inform and target future research efforts.

ED influenza organisational plans and patient education

The ACEM [13] and ACEP [14] influenza management plans outline education for health personnel, vaccination and protective clothing as well as service redesign during episodes of seasonal and pandemic influenza. The ACEP have documented in their influenza plan broad advice to patients regarding home quarantine and how to reduce virus transmission along with warning signs patients need to consider in deciding if they need to return to the ED. Influenza patient information may be supplemented with general influenza advice from the CDC fact sheets which would require the patient to be directed to the online resource [15]. In Australia, some state governments have ED fact sheets that have been specifically developed to enhance communication between the health professional and patient [38]. These ED fact sheets have been written in several languages however influenza is not one of the topics available. Similar to the CDC, the Australian Department of Health website provides seasonal influenza fact sheets for each year and the information is linked with encouragement to be vaccinated as part of the Immunise Australia program [16].

Influenza education within hospital influenza pandemic plans

Although a comprehensive search of the literature failed to yield any studies that solely evaluated the effectiveness of IEs in the ED, two studies did describe patient education as a component of a hospital pandemic

influenza response or preparedness plan. One study [39] reported on hospital-based mitigation strategies to increase surge capacity during the 2009 H1N1 pandemic, with a 'public education plan' forming part of this preparedness activity. While no details were provided on how these plans were implemented, the list did include intranet, internet, phone line, web-based conference, and signage. The second study [40] trialled a 'rapid medical screening process' to improve ED patient flow during a seasonal influenza outbreak. As part of the screening process, a 5-10 minute patient education group session related to H1N1 influenza was delivered by a medical provider with information on treatment, complications, and the viral illness. Within this group education session, patients were able to ask questions and were given pre-printed discharge instructions along with any medications.

Influenza patient education

From this assessment of influenza patient education literature, two studies examined the format of influenza printed educational materials in relation to how well information was retained by patients. Cameron et al. [41] showed that influenza printed educational materials containing 'facts and myths' with evidence counteracting the myths was an effective approach to increasing patient knowledge and recall accuracy. McGlone et al. [42] sought to determine whether the grammatical assignment of viral transmission to the virus instead of people (e.g., the virus infects people vs. people are infected by the virus), was more effective at communicating the severity of influenza illness and provoking a heightened response among the study participants. An additional finding from this study indicates participants were also more likely to seek preventative measures such as vaccination.

Implications for influenza self-care

During seasonal influenza and pandemics, EDs are often over utilised, especially by those from lower socio-economic groups, creating overcrowded conditions and staffing/resource pressures. Whilst current ED organisational management plans indicate patient education should be provided to both severely affected by influenza and those with mild illness, the detail on the type of information, its effectiveness in reducing representation to the ED and the role patient education plays in supporting the patient at home after presentation to the ED with influenza or influenza like symptoms requires research.

Conclusion

In summary, there are many sources of both formal and informal influenza information however the evidence of their efficacy in educating adults with influenza like illness or proven influenza is still to be determined. There is a need for methodological sound studies of influenza education interventions within both domains of public health and clinical settings to ensure patients remain well informed and safe during seasonal and pandemic influenza outbreaks.

References

1. WHO (2014) Influenza (Seasonal) Fact Sheet No 211. World Health Organization, Geneva, Switzerland.
2. Centers for Disease Control and Prevention (2015) Update: Influenza Activity—United States and Worldwide, May 24–September 5, 2015. *Morbidity and Mortality Weekly Report* 64: 1011-1016.
3. WHO (2016) Influenza Update Number 257. World Health Organization, Geneva, Switzerland.
4. Velasco RP, Praditsithikorn N, Wichmann K, Mohara A, Kotirum S, et al. (2012) Systematic review of economic evaluations of preparedness strategies and interventions against influenza pandemics. *PLoS One* 7: e30333.

5. de Francisco Shapovalova N, Donadel M, Jit M, Hutubessy R (2015) A systematic review of the social and economic burden of influenza in low- and middle- income countries. *Vaccine* 33: 6537-6544.
6. Dugas AF, Hsieh Y-H, Levin SR, Pines JM, Mareiniss DP, et al. (2012) Google Flu Trends: Correlation with emergency influenza rates and crowding metrics. *Clin Infect Dis* 54: 463-469.
7. Hoot NR, Aronsky D (2008) Systematic review of emergency department crowding: causes, effects and solutions. *Ann Emerg Med* 52: 126-136.
8. Shapiro JS, Genes N, Kuperman G, Chason K, Clinical Advisory Committee H1N1 Working Group, et al. (2010) Health information exchange, biosurveillance efforts and emergency department crowding during the spring 2009 H1N1 outbreak in New York City. *Ann Emerg Med* 55: 274-279.
9. Hiller KM, Stoneking L, Min A, Rhodes SM (2013) Syndromic surveillance for influenza in the emergency department-A systematic review. *PLoS One* 8: e73832.
10. Bensberg M, Kennedy M, Bennetts S (2003) Identifying the opportunities for health promoting emergency departments. *Accid Emerg Nurs* 11: 173-181.
11. Boyle J, Crilly J, Keijzers G, Wallis M, Lind J, et al. (2012) Impact of influenza across 27 public emergency departments in Australia: a 5 year descriptive study. *Emerg Med J* 29: 725-731.
12. Peters TR, Suerken CK, Snively BM, Winslow JE, Nadkarni MD, et al. (2013) Influenza testing, diagnosis and treatment in the emergency department in 2009-2010 and 2010-2011. *Acad Emerg Med* 20: 786-794.
13. ACEM (2014) Management of severe influenza, pandemic influenza and emerging respiratory illnesses in Australasian Emergency Departments. Australasian College for Emergency Medicine, Australia.
14. American College of Emergency Physicians (2009) FAQ's for Emergency departments in epidemic or pandemic influenza outbreak. American College of Emergency Physicians, Irving, Texas, USA.
15. CDCP (2015) What you should know for the 2015-2016 influenza season. Centers for Disease Control and Prevention, USA.
16. Australian Government (2015) Immunise Australia Program Influenza Fact Sheet for Consumers-Flu Season 2015. Department of Health, Australia.
17. Schull MJ, Mamdani MM, Fang J (2004) Community influenza outbreaks and emergency department ambulance diversion. *Ann Emerg Med* 44: 61-67.
18. Glaser CA, Gilliam S, Thompson WW, Dassey DE, Waterman SH, et al. (2002) Medical care capacity for influenza outbreaks, Los Angeles. *Emerg Infect Dis* 8: 569-574.
19. Fitzgerald G, Aitken P, Shaban RZ, Patrick J, Arbon P, et al. (2012) Pandemic (H1N1) Influenza 2009 and Australian emergency departments: implications for policy, practice and pandemic preparedness. *Emerg Med Australas* 24: 159-165.
20. Sprung CL, Zimmerman JL, Christian MD, Joynt GM, Hick JL, et al. (2010) Recommendations for intensive care unit and hospital preparations for an influenza epidemic or mass disaster: summary report of the European Society of Intensive Care Medicine's Task Force of intensive care unit triage during an influenza epidemic or mass disaster. *Intensive Care Med* 36: 428-443.
21. Dugas AF, Morton M, Beard R, Pines JM, Bayram JD, et al. (2013) Interventions to mitigate emergency department and hospital crowding during an infectious respiratory disease outbreak: results from an expert panel. *PLoS Currents* 5.
22. Rotheram-Borus MJ, Piacentini J, Van Rossem R, Graae F, Cantwell C, et al. (1996) Enhancing treatment adherence with a specialized emergency room program for adolescent suicide attempters. *J Am Acad Child Adolesc Psychiatry* 35: 654-663.
23. Williams A, Lindsell C, Rue L, Blomkalns A (2007) Emergency Department education improves patient knowledge of coronary artery disease risk factors but not the accuracy of their own risk perception. *Prev Med* 44: 520-525.
24. Szpiro KA, Harrison MB, Van Den Kerkhof EG, Lougheed (2008) Patient Education in the emergency department: A systematic review of interventions and outcomes. *Advanced Emergency Nursing Journal* 30: 34-49.
25. Yvonne Chan YF, Nagurka R, Richardson LD, Zaets SB, Brimacombe MB, et al. (2010) Effectiveness of stroke education in the emergency department waiting room. *J Stroke Cerebrovasc Dis* 19: 209-215.
26. Pappano D, Humiston S, Goepp J (2004) Efficacy of a pediatric emergency medicine department-based influenza vaccination program. *Arch Pediatr Adolesc Med* 158: 1077-1083.
27. Blank FS, Doe S, Keyes M, Labrie L, Sabourin D, et al. (1998) Development of an ED teaching program aimed at reducing prehospital delays for patients with chest pain. *J Emerg Nurs* 24: 316-319.
28. Magid D, Behrman A, Stemhagen A, Jacobson S (1990) AIDS education in the emergency department. *Ann Emerg Med* 19: 758-763.
29. Chan YF, Lavery R, Fox N, Kwon R, Zinzuwadia S, et al. (2008) Effect of an educational video on emergency department patient stroke knowledge. *J Emerg Med* 34: 215-220.
30. Wang TC, Kyriacou DN, Wolf MS (2010) Effects of an intervention brochure on emergency department patients' safe alcohol use and knowledge. *J Emerg Med* 39: 561-568.
31. Tapp S, Lasserson TJ, Rowe BH (2007) Education interventions for adults who attend the emergency department for acute asthma. *Cochrane Database Syst Rev* 18: CD003000.
32. Yaffe J, Montgomery P, Hopewell S, Shepard LD (2012) Empty Reviews: A description and consideration of cochrane systematic reviews with no included studies. *PLoS One* 7: e36626.
33. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, et al. (2009) The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ* 339: b2700.
34. CDCP (2014) Overview of influenza surveillance in the United States. Centers for Disease Control and Prevention, Georgia, USA.
35. CASP (2013) Critical Appraisal Skills Programme: Making Sense of Evidence. Critical Appraisal Skills Programme, Oxford, UK.
36. SIGN (2013) Critical Appraisal: Notes and Checklists. Scottish Intercollegiate Guidelines Network, UK.
37. NIH (2014) Clinical Trial. National Institutes of Health, Maryland, USA.
38. Victorian State Government (2012) Emergency Department factsheets. Victorian, Australia.
39. Scarfone RJ, Coffin S, Fieldston ES, Falkowski G, Cooney MG, et al. (2011) Hospital-based pandemic influenza preparedness and response: strategies to increase surge capacity. *Pediatr Emerg Care* 27: 565-572.
40. Fagbuyi DB, Brown KM, Mathison DJ, Kingsnorth J, Morrison S, et al. (2011) A rapid medical screening process improves emergency department patient flow during surge associated with novel H1N1 influenza virus. *Ann Emerg Med* 57: 52-59.
41. Cameron KA, Roloff ME, Friesema EM, Brown T, Jovanovic BD, et al. (2013) Patient knowledge and recall of health information following exposure to 'facts and myths' message format variations. *Patient Educ Couns* 92: 381-387.
42. McGlone MS, Bell RA, Zaitchik ST, McGlynn J 3rd (2013) Don't let the flu catch you: agency assignment in printed educational materials about the H1N1 influenza virus. *J Health Commun* 18: 740-756.