American Journal of Infection Control xxx (2015) 1-7

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major article

Implementing systems thinking for infection prevention: The cessation of repeated scabies outbreaks in a respiratory care ward

Sheuwen Chuang PhD [a,*], Peter. P. Howley PhD [b], Shih-Hua Lin BS [c]

[a] Health Policy and Care Research Center, School of Health Care Administration, Taipei Medical University, Taipei City, Taiwan
[b] School of Mathematical and Physical Sciences/Statistics, University of Newcastle, Callaghan, NSW, Australia
[c] Department of Infection Control, Taipei Hospital Ministry of Health and Welfare, New Taipei City, Taiwan

Key Words:
Health care–associated infection
Systems thinking
Scabies outbreak
Root-cause analysis
Systems-oriented event analysis

Background: Root cause analysis (RCA) is often adopted to complement epidemiologic investigation for outbreaks and infection-related adverse events in hospitals; however, RCA has been argued to have limited effectiveness in preventing such events. We describe how an innovative systems analysis approach halted repeated scabies outbreaks, and highlight the importance of systems thinking for outbreaks analysis and sustaining effective infection prevention and control.

Methods: Following RCA for a third successive outbreak of scabies over a 17-month period in a 60-bed respiratory care ward of a Taiwan hospital, a systems-oriented event analysis (SOEA) model was used to reanalyze the outbreak. Both approaches and the recommendations were compared.

Results: No nosocomial scabies have been reported for more than 1975 days since implementation of the SOEA. Previous intervals between seeming eradication and repeat outbreaks following RCA were 270 days and 180 days. Achieving a sustainable positive resolution relied on applying systems thinking and the holistic analysis of the system, not merely looking for root causes of events.

Conclusion: To improve the effectiveness of outbreaks analysis and infection control, an emphasis on systems thinking is critical, along with a practical approach to ensure its effective implementation. The SOEA model provides the necessary framework and is a viable complementary approach, or alternative, to RCA.

Copyright © 2015 by the Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.

Scabies outbreaks are common in long-term care facilities worldwide.[1-5] Scabies is a significant source of morbidity to residents in these settings and among elderly or immune-compromised patients in hospitals, owing to its highly contagious nature; however, it is not a notifiable disease in most countries, and thus institutional scabies outbreaks in health care settings are underreported.[6] Furthermore, scabies is associated with considerable management-related and economic burdens, including prolonged hospitalizations, ward closures, a large number of frequent and intensive patient treatments, laundry and environmental disinfection procedures, and the need for extra staffing.[2,3]

To prevent scabies outbreaks, evidenced-based guidelines containing well-recognized factors that facilitate the institutional development of scabies and nosocomial epidemics as a part of the structure and components of an infection control program have been widely used by health care organizations. The adoption of root cause analysis (RCA) to complement an epidemiologic investigation of infection-related adverse events or outbreaks is often undertaken at the request of an accreditation agency or infection control program.[7-10] RCA is used to understand the cause-and-effect mechanisms of infection-related adverse events, based on a patient's outcome, for recommendations of improvement action, whereas the process of epidemiologic investigation typically looks at clusters of infections or individual cases of epidemiologic importance, and is not fully dependent on patient outcome. The 2 approaches together provide epidemiologic and managerial information for infection prevention and control.[8]

Despite the known value of RCA for both individual and organizational development in the promotion of improved infection control and health care,[11] hospital-acquired infections continue to occur and continue to present a risk to users of health care.[12] There

* Address correspondence to Sheuwen Chuang, Health Policy and Care Research Center, Taipei Medical University, No. 250, Wuxing St, Taipei 11031, Taiwan.
E-mail address: sheuwen@tmu.edu.tw (S. Chuang).

Conflicts of interest: None to report.

0196-6553/$36.00 - Copyright © 2015 by the Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.ajic.2015.02.002

is an undercurrent of opinion that RCA has only limited effectiveness. The concerns regarding RCA include, but are not limited to, fewer than half of action plans being reportedly effective[13]; recommended actions not being fully integrated into the structure of the relevant organization[14]; being heavily affected by professional, disciplinary, and departmental politics in terms of timing and use of results[15]; the need to improve the effectiveness of RCA training and front-line practices in health care settings[16]; and the existence of only limited evidence to support RCA's effectiveness.[17-20] Furthermore, for infection prevention, to date there has been only limited evaluation of the effectiveness of programs embedded with RCA to support the prioritization of infection control resources and management of interventions.[2,19] Moreover, RCA is considered to work best in assessing single serious adverse events, usually 1 patient within a well-described process based on outcome, rather than common patient safety problems (eg, hospital-acquired infection, contrast-induced nephropathy, delirium in a hospitalized patient).[9]

Considering the aforementioned concerns surrounding the effectiveness of RCA, its widespread application may have created a false sense of security. Under the increasing cost burden of infection prevention, hospitals and health care workers (HCWs) face multiple challenges in preventing hospital-acquired infections and sustaining patient safety. It is important for health care organizations (HCOs) and HCWs to understand how an infection-related adverse event or outbreak analysis through RCA may be effective, and how it may not; however, there is a paucity of studies that address this issue. This article addresses the research lacuna, describing three successive scabies outbreaks which occurred within a short period in a Taiwan hospital and how the third and final outbreak was stopped after RCA failed each time to cease worsening outbreaks from recurring. The article assesses the RCA results and illustrates both the importance of systems thinking in outbreak analysis and a potential model for systematically implementing systems thinking.

METHODS

The setting

A 60-bed respiratory care ward (RCW) of a Taiwan public hospital experienced 3 scabies outbreaks over a 17-month period between August 2007 and March 2009, with increasing infection densities of 3.8%, 15.9%, and 20.7%. The RCW was a controlled area, open daily to patient visitors for limited hours. Patients who required prolonged mechanical ventilation were mostly unconscious and required assistance with bathing, positioning, and other nursing care.

Key findings from 3 RCAs

During each scabies outbreak, following the prompt recognition of scabies, confirmation of the diagnosis, and initiation of medical treatment, a task force including doctors, infection controllers, nurses, and a quality manager was organized as a temporary investigation team to perform RCA for preventing future hospital-acquired scabies. They knew the RCA process and had requisite knowledge of scabies transmission, diagnosis and treatment. The first outbreak's RCA report identified the primary root cause as the lack of a standard procedure for checking visitors' skin condition, and thus the intervention involved establishing a self-declaration form and reporting procedure for visitors.

For the second outbreak, the report centered on a patient who had suspected scabies, but who lacked a confirmed diagnosis and had been housed in a regular room rather than quarantined. Because the doctor in charge adhered to the standard procedure (ie, no isolation without confirmation of scabies), the corrective action from this RCA was to add a rule under which patients with suspected scabies are to be isolated for up to 14 days and treated as having scabies.

For the third outbreak, the primary root cause was that a patient with suspected scabies was isolated for 2 weeks, but then moved back to a regular room because then diagnosis of scabies was not yet confirmed. The doctor in charge adhered to the guideline that a patient could be isolated for only up to 14 days if scabies was not confirmed at the end of isolation, to address cost concerns. Later, the patient was found to have crusted scabies, and was subsequently isolated for 6 months. Seven reported cases initially signaled the third outbreak on December 21, 2008. After crusted scabies was diagnosed in the index patient, scabies was subsequently diagnosed in another 28 individuals through March 2009. The outbreak totaled 35 cases, with 31 confirmed cases and 4 suspected cases, including 30 patients, 4 personal care workers, and 1 nurse.

Implementing a systems-oriented approach

During the third outbreak, as for the first two outbreaks, an RCA was conducted. This time, however, the hospital was concerned with the 2 previous failures to provide sustained interventions to end the scabies outbreaks through traditional guidelines and RCA. Consequently, they also assessed the third outbreak using then then newly developed systems-oriented event analysis (SOEA) model.[21] Developed based primarily on systems theory, systems engineering, and a risk management model for social–technical systems, the SOEA model is a structured, systematic method with the ability to analyze multiple related cases or events in an integrated platform. It utilizes systems modeling and analysis to prioritize hazards and formulate risk control recommendations for them, and so to establish integrated systemic controls for hazard prevention. This is achieved through its 3 core functions, defined by 7 steps: establishment of system concept (steps 1 and 2), hazard management (steps 3, 4, and 5), and alignment of control activities at the governance, management, and operation (G-M-O) levels (steps 6 and 7).[21]

The underlying principle for implementing the SOEA model is to establish a commitment to "systems analysis," the holistic analysis of the system behind the incidents, instead of searching for individual root causes as in traditional RCA. The SOEA method guides investigation teams in strengthening the capacity to manage patient safety within the systems thinking environment through specifically designed instruments (charts and worksheets). A graphical presentation of patient-centered operational thinking as shown in Figure 1 was used to better identify the relevant health care systems and their associated components surrounding patients, beginning at the front-line level (ie, microsystem level), and help team members understand the systematic implementation. A systems analysis for the selected events is processed via the 3 core functions and 7 steps of the SOEA model; details of how to apply the SOEA method have been published previously.[21]

RESULTS

Termination of repeat outbreaks

Since implementation of the integrated systems intervention derived from the systems analysis using the SOEA model, no nosocomial scabies were reported in more than 1975 days at the time of manuscript submission. The previous intervals between seeming eradication and repeat outbreaks after applying RCA were 270 days and 180 days.

Download English Version:

https://daneshyari.com/en/article/5867071

Download Persian Version:

https://daneshyari.com/article/5867071

Daneshyari.com