

A review on the effectiveness of multimodal infection control programmes in the reduction of bacterial contamination in residential care home for elderly persons with nasogastric tube feeding

S.S.K.Ho^{1*}, Lee, T.F.D²

¹ School of Nursing, The Hong Kong Polytechnic University, Hung Hom, Hong Kong,

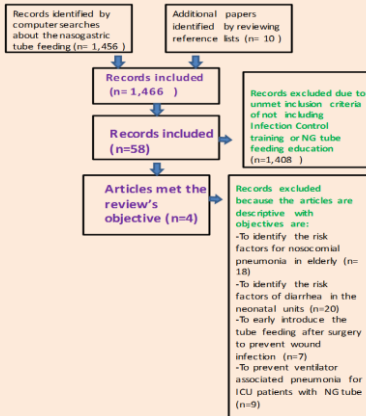
² The Nethersole School of Nursing, The Chinese University of Hong Kong, Shatin, Hong Kong

Introduction

It has been reported that Methicillin Resistant Staphylococcus Aureus (MRSA) colonized in the nasal cavity of residents with a nasogastric tube (NG tube) in residential care home for elders (RCHes). Inadequate infection control knowledge regarding NG tube feeding among RCHes staff has been found to lead to bacterial contamination of NG tube feeding system.

Method

A comprehensive search for original research published between 1990 to 2017 was conducted through the electronic databases CINAHL, CNKI, Cochrane Library, Medline (2000+) and Ovid nursing. The search included all English and Chinese articles with search term descriptors of "NG tube feeding" and "infection control education".



Intervention: Well- designed Multimodal ICP

Class	Content	Teaching & Learning Strategies
1.	<u>Hand hygiene education</u> -Assessment of hand decontamination before & after the procedure	-Use of PowerPoint /video -Use of evidence-based infection control guidelines & protocol -Pamphlet distribution as a reminder
2.	<u>NG Tube Care</u> -The concept of infection control in NG tube feeding -What is NG feeding? Who does need it? -The prevalence of the NG feeding in RCHes? -What types of the NG tubes are common in RCHes? -Knowledge and skill to insert the NG tube -Care of the insertion site and NG tube	-Use of interaction group education, peer learning & empowerment -Clinical –scenario based study -Experience sharing -Practical observation in hand hygiene -Performance observation on NG tube feeding and hand hygiene -Pre- test & post-test questionnaires after intervention
3.	<u>Proper handling on NG tube feeding</u> -Preparation of feeds -How to reconstituting or diluting feeds? -How to apply the non- touch technique? -Storage of feed -Steps & technique in the administration of the NG tube feeding -How to prepare the equipment properly -How to test the tube instu -How to perform the safe NG tube feeding? -Disinfection of the administration set & the feeding reservoir after used -Mouth toilet -Good documentation skill	-Dissemble small groups -Demonstration and return-demonstration -Discussion
4.	<u>PPE use based on infection precaution</u> -When do the RCHes staff use the PPE during the NG feeding?	
5.	<u>Practical workshop on NG feeding</u> -Demonstration & return demonstration of the NG tube feeding	
6.	Revision	

Conclusion

Evidence was not strong to demonstrate the effectiveness of multimodal ICPs in the reduction of the NG tube feeding contamination. Further studies are recommended to establish a well-designed multimodal ICP to reduce NG tube feeding contamination.

Results

Four articles met the review objectives. Two were cluster RCTs, another were RCTs and quasi-experimental pretest posttest control study. The common characteristic of these four studies was to implement multimodal teaching strategies in Infection Control Programmes (ICPs) to RCHes staff. Multimodal strategies are a combination of interactive group education, skill observation and feedback of performance to enhance infection control knowledge of RCHes staff. Among them, two studies showed no change in the overall MRSA infection rate while two studies found significant reduced MRSA colonization in NG tubes after multimodal ICPs. Indeed, only one study demonstrated multimodal ICP could enhance the knowledge and skill of NG tube feeding among RCHes staff.

First Author & Year	Study design; setting, target population & duration of study	Objective	Intervention	Outcome measures	Finding
Mody et al., 2015	Randomized clinical trial; RCHes; RCHes staff; 36 months	To test if a multimodal ICP reduces the rate of MRSA infection & device-related infections (NG tube)	1)Hand hygiene 2)PPE use 3)Infection control programme on medical device care (NG tube) 4)Active surveillance for MRSA infection	1)Incidence of device-related infection (NG tube) 2) Rate of MRSA colonization	1)Reduced MRSA colonization in NG tube (p<0.05) 2)Decreased in overall rate of MRSA (rate ratio, 0.77; 95% CI, 0.62-0.94)
Ho et al., 2012	Quasi-experimental pre-post test control design; RCHes; RCHes staff; 3 months	To investigate the effectiveness of ICP on knowledge & practice of NG tube feeding & to explore the rate of MRSA colonization and total bacterial counts in the NG tube feeding system	1)Hand hygiene 2)ICP on NG tube feeding 3)PPE use & infection precaution	1)Knowledge & practice skill on NG tube feeding of staff 2) Total bacterial counts & MRSA colonization in NG feeding system	1)staff's knowledge & practical skill showed a significant improvement (p<0.05) 2) NG tube feeding contamination was significantly lower (p<0.05) 3)Decrease MRSA colonization on NG tube
Kathleen et al., 2012	Cluster randomized controlled trial; RCHes; RCHes staff; 5 months	To assess the impact of multimodal ICP on reducing rate of infection	1)Hand hygiene 2)ICP on care of medical device such as NG tube, how to handle the enteral nutrition & general infection control practice	Rate of infection	No difference in the infection rate between the groups on unadjusted (HR=1.00; 95% CI, 0.89-1.13) or the adjusted (HR=0.99; 95% CI, 0.87-1.12; p=0.86) marginal Cox regression analysis
Baldwin et al., 2010	Cluster randomized controlled trial; RCHes; RCHes staff; 12 months	To test the impact of an ICP in reduction of MRSA colonization rate	1)Hand hygiene 2)Use of personal protective equipment & management of enteral feeding 3)Decontamination of the medical equipment	1)MRSA infection rate 2)Infection control audit score	1)No change in the MRSA infection rate 2)Mean infection control audit scores were significantly higher in the intervention homes compared with the control homes (p<0.001)