Effectiveness of Teaching of Neonatal Resuscitation Programme at a Workshop for a Mixed Population of Medical Personnel

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Abstract

We evaluated the effectiveness of teaching at a neonatal resuscitation programme (NRP) workshop held for 35 medical personnel (including postgraduate trainee doctors, general duty medical officers, nursing officers and probationer nurses) using a one-group pretest-posttest design. None of the participants had any formal exposure to the NRP guidelines. A pre-workshop test of 20 multiple-choice questions was administered to all the participants. At the end of the workshop, the same 20 questions were administered and the two scores compared using t-test for paired data on SPSS statistical software. The mean pre-workshop score was 9.03 (SD 2.66) which improved to a mean of 15.53 (SD 1.93) post-workshop. This improvement was highly significant with $p < 0.0001$ (two-tailed) and the 95% confidence interval being -7.41 to -5.59. Subgroup analysis revealed that nursing officers and probationer nurses showed highly significant improvement in the post-workshop scores while trainee doctors doing Medicine, Pediatrics and the general duty medical officers showed statistically significant improvement in the post-workshop scores. This study shows that a medical workshop is an effective means of imparting knowledge to a mixed group of medical personnel.

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Key Words : Evaluation; Neonatal resuscitation; Teaching; Workshop

Introduction

The secret to the success of any medical workshop lies in the effective transfer of knowledge from the faculty to the participants. A workshop on NRP was recently conducted at a tertiary care service hospital based on the latest international guidelines [1]. Those attending included post-graduate trainee doctors, general duty medical officers, nursing officers and probationer nurses. None of the participants had been formally exposed to the NRP guidelines. A set of 20 multiple choice questions was administered before and after the workshop to assess the knowledge gained by this mixed group of participants.

Material and Methods

All participants were administered a pre-workshop test consisting of 20 multiple choice questions covering the entire NRP protocol. The workshop itself consisted of chapter-wise multimedia lectures on all the chapters of NRP [1] as well as workstations where participants were demonstrated the skill on mannequins and allowed to acquire these skills by supervised practice. The same test was administered at the end of the workshop. The two sets of answers were evaluated, marked and compared overall as well as within sub-groups. Statistical analysis was done on SPSS software using the t-test for paired samples.

Results

Out of a total of 35 participants, 34 completed both the pre-workshop and post-workshop test and thus qualified for entry into the study. One trainee in Obstetrics could not complete the post-test due to an emergency call from the ward. The participants' groups according to their qualification were as follows: pediatric trainees - 4 (11.4%); medicine trainees - 4 (11.4%); anaesthesiology trainees - 3 (8.6%); obstetrics and gynecology trainees - 3 (8.6%); general duty medical officers - 5 (14.3%); nursing officers - 7 (20.0%) and probationer nurses - 9 (25.7%).

Out of a maximum possible score of 20 for each test, the lowest pre-workshop score was 3 out of 20 (15.0%) and the highest was 16 (80.0%). The lowest post-workshop score was 11 out of 20 (55.0%) while the highest was 20 (100.0%). The mean pre-workshop score was 9.03 (SD 2.66) which had risen post workshop to a mean of 15.53 (SD 1.93). Based on the t-test for paired samples the two-tailed p value of this difference was < 0.0001 , suggesting that the improvement in the post-workshop score was highly significant; 95% confidence interval for the same being -7.44 to -5.99.

Subgroup analysis of scores was done and the results are depicted in Table 1. This analysis was not done for the trainees of Obstetrics as only two of them completed the study and the resulting scores had a skewed distribution. Sub-group analysis revealed highly significant improvement (two-tailed

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Table 1
Subgroup-wise pre and post workshop scores

Subgroup	N	Mean Pre workshop score (SD)	Mean Post workshop score (SD)	p value (two tailed)	95% confidence interval
Probationer nurses	9	7.89 (1.45)	15.56 (1.33)	< 0.0001	- 8.82 to - 6.51
Nursing officers	7	8.86 (2.85)	15.43 (1.72)	< 0.0001	- 8.83 to - 4.32
Trainees in medicine	4	10.00 (1.15)	15.75 (2.06)	< 0.005	- 8.14 to - 3.36
General duty medical officer	5	9.00 (2.94)	14.50 (1.91)	< 0.04	- 10.78 to - 0.22
Trainees in pediatrics	4	12.25 (2.63)	16.25 (1.50)	< 0.02	- 6.91 to - 1.09
Trainees in anesthesiology	3	10.33 (2.08)	16.33 (4.73)	< 0.07	- 13.45 to - 1.45
Trainees in obstetrics	2	6.00 (4.24)	10.50 (9.19)	Not done as distribution skewed	Not done as distribution skewed

p values) in the post-workshop scores of Probationer nurses ($p < 0.0001$; 95% CI -8.82 to -6.51), Nursing officers ($p < 0.0001$; 95% CI -8.83 to -4.32), and trainees in Medicine ($p < 0.005$; 95% CI -8.14 to -3.36). There was statistically significant improvement in the post-workshop scores of general duty medical officers ($p < 0.04$; 95% CI -10.78 to -0.22) and trainees in Pediatrics ($p < 0.02$; 95% CI -6.91 to -1.09) while the post-workshop improvement of scores of trainees in Anaesthesiology did not reach statistical significance ($p < 0.07$).

Discussion

The simplest method of testing effectiveness of training at a workshop is to administer the same set of objectively structured questions before and after the session and to analyze the difference.

Halder and co-workers assessed the effectiveness of training in infant feeding practices amongst 34 community level health workers in West Bengal [2]. They held multiple training sessions for the participants also called 'Influencers'. They conducted an assessment before the commencement of training and repeated assessments after every training session. They concluded that their training improved the knowledge of the participants and that repeat sessions were very helpful. In our study, knowledge was assessed after a single training event in a group consisting of medical personnel with varying levels of expertise and significant difference was found in the post workshop scores.

In another Indian study, knowledge on Vitamin A deficiency was imparted to 95 Anganwadi workers in Haryana through lectures, demonstration and discussion. The participants were divided into two groups with the first group being shown coloured film slides in addition to the other methods while the second group was not shown the slides. Pre and post test showed significant increase in knowledge, more so in the group shown the slides. The authors conclude that use of audiovisual aid increases the transfer of knowledge [3]. In our study too, multimedia presentations were used for the lecture sessions and the fact that our study subjects were more

qualified than the subjects in the above quoted study probably helped in better transfer of knowledge.

Similar methods of assessing effectiveness of workshops and teaching sessions have been used and proved to be helpful for general practitioners [4]; asthma patients [5]; school teachers [6], and parents [7].

The only study assessing transfer and retention of knowledge and skills after a NRP workshop was conducted on 27 undergraduate medical students by Agarwal and colleagues from the All India Institute of Medical Sciences [8]. They found the pretest score on 20 questions averaged at 25% and improved to 87% post workshop. The retention of knowledge as assessed in this study, is not sound due to a high attrition rate with only 14 of the original 27 students participating in the follow-up testing at 8 weeks post-training. Our study showed a mean pre-workshop score of 9.03 out of a maximum possible of 20 (45.15%) and this increased to a mean of 15.53 (77.65) post-workshop. The higher pre-workshop scores in our study could be explained by the fact that in contrast to the study above, all participants in our study were practising medical personnel who have been working in the wards and thus have been exposed (informally) to some aspects of neonatal resuscitation. The post-workshop increase in score, though highly significant, was 77.65% as compared to 85% in Agarwal's study; this is probably a pointer to the fact that we have to improve our method of conducting future workshops.

Most importantly, our study is unique because the population undergoing training was highly heterogeneous. Despite this, almost every sub-group has shown significant improvement post-workshop, thereby implying effective transfer of knowledge. This is of special significance to us in the Armed Forces, because in smaller hospitals, it is a mixed group of medical personnel who are responsible for patient care and may be required to take decisions in emergencies before the concerned specialist can arrive. This study shows the path towards improving the quality of care and outcome

in our service hospitals by conducting workshops and training sessions for a mixed group of medical personnel with assured benefits.

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