Original Research Article

Assessment of training need and training efficacy for national program for prevention and control of cancer, diabetes, cardiovascular diseases and stroke among medical officers of West Bengal, India

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ABSTRACT

Background: The national program for prevention and control of cancer, diabetes, cardiovascular diseases and stroke (NPCDCS) has been rolled out in West Bengal, with its implementation initiated through state-wide training of Medical Officers (M.O). For attaining requisite competency for meeting NPCDCS objectives, MOs have been trained at their respective district levels. Present study aimed to assess the training need, training efficacy and need for further training.

Methods: A repeat cross-sectional study was conducted from May-July 2018 for M.Os of six randomly chosen districts of West Bengal, out of those whereat NPCDCS was launched in first phase. 40-45 M.Os were randomly selected from each district in liaison with district level health authorities. The total sample size was 352 with Finite population correction. On the days of training, pre and post training surveys were conducted with an identical semi-structured, pre-tested and validated questionnaire (Cronbach's alpha >0.8) covering different levels of cognitive domain, with a maximum possible score of 100 marks. No negative marking was done for incorrect responses. Training was imparted by the Principal Investigator (accredited trainer). Ethical clearance was granted by the State Health Directorate. Informed consent from each participant was obtained.

Results: Dependent sample t-test revealed significant increment (p<0.0001) in post-test scores (t=63.134) & one-way repeated measure general linear model (GLM) also revealed F=29.617 (p<.0001). The "Effect Size" was classified as "Huge" (Cohen's D=63.134/√(352)= 3.365), as was noted between pre-test and post-test scores, based on Cohen's convention and Sawilowsky's addition. It was further noted that even after six hour training sessions there was 27.44% knowledge gap (p<0.0001) after adjusting for Bonferroni.

Conclusions: Imperativeness of training coupled with periodic refresher training has been established as a pre-requisite for successful implementation of NPCDCS.

Keywords: NPCDCS, Pre-test, Post-test, Medical officers, Training

INTRODUCTION

India is passing through rapid demographic, environmental and lifestyle related transitions. This has resulted into an "Onion peel phenomenon" symbolized by significant changes in magnitude and pattern of diseases across the country showing anupsurge in chronic non-communicable diseases (NCDs) including heart diseases, chronic lung diseases, cancer and diabetes, while communicable diseases and reproductive and nutritional disorders are on the decline.[1] They are the leading cause ofdeath, accounting for over 70% of

premature mortality and significant loss of DALY, placing them ahead of Communicable diseases, Maternal, Prenatal, and Nutritional conditions (WHO 2017).[2] The Ministry of Health & Family Welfare launched National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS) in October 2010. During the 11th five year plan period, 100 districts over 21 states were covered and have been contemplated to extend to the entire country in 12th five year plan.[3,4] Under this programme, there is acceleration in setting up NCD clinics in CHCs and District Hospitals as well as number of people screened and identified with high blood pressure and/or high blood sugar.[2] However, majority of the population did not have the opportunity for screening for high blood pressure and high blood sugar. Screening for common cancers (oral, breast and cervical cancers) also did not pick up to expected levels. NPCDCS has been launched with objectives of health promotion, capacity building including human resource development, early diagnosis and prompt treatment on integration with different levels of health care systems in a comprehensive manner.[1,2] NPCDCS is currently focusing a major concentration towards building capacity of medical officers for service delivery and training of staff working for NCDs. It is expected that trained medical officers would be in a position not only to organize and supervise population based screening program but also to provide comprehensive treatment to those who are confirmed to have NCDs along with referral of cases that are in need of higher levels of care. This training would build capacity of Medical Officers to manage common uncomplicated NCDs at their level and also give best possible initial treatment in medical emergencies like myocardial infarction and stroke, before referring to higher level of care. Government's commitment to reduce premature mortality due to NCDs by one-third by 2030 as per sustainable development goals would not be possible unless the entire medical fraternity commits itself to this challenging goal.[5] In this backdrop, the current study was conducted to (a) assess the Training need among medical officers regarding NPCDCS, (b) determine the efficacy of the training delivered towards them and (c) find out need for further training in future, if any.

METHODS

Study type and study design

Descriptive study with cross-sectional design.

Study setting

The State of West Bengal comprise 28 districts and health districts.[6] The study was conducted among the medical officers including the block medical officers in six districts in the southern part of the State, namely, North 24-parganas, PurbaMedinipur, Nadia, Murshidabad, Rampurhat and Jhargram.

Study period: 3 months (May-July, 2018).

Study population

The medical officers and Block Medical Officers who were working at the same place of posting for the last 6 months were considered as study population.

Sampling design

Two-stage simple random sampling was followed. Despite the nationwide inception of NPCDCS was long back, it was rolled out in the state of West Bengal since 2016-17.[6] Once the state-level training of trainers (TOT) was completed, it was decided for a strategic project implementation plan (PIP) for the 2nd quarter of the year 2018 and the medical officers of districts of southern part of West Bengal were permitted to be trained at the district level. Hence, in the first stage, out of the total 18 districts covered in South Bengal, 6 (33%) were selected following simple random sampling to allow representability. In the second stage, medical officers were selected from each of the districts who were posted over different CHCs and PHCs. The pay-roll was collected from district head quarter(s) with liaison with the district level health officials, and 40-45 M.Os were selected from each such district using simple random sampling. The participants for training were selected so that at least two medical officers could subsequently be deployed for running of the proposed NCD clinics, in each health care setting.

Sample size

In absence of any previous study on training need assessment regarding NPCDCS, prevalence level of training need for medical officers were considered as 50%, to ensure maximum sample size. The complement of prevalence was also taken as 50%. Assuming the precision level "L"= 5% while $Z\alpha$=1.96 at 95% C.I., using formula of $(Z_2 \times Px(1-P)) / L_2$, the sample size was calculated as 385. Considering finite population of medical officers as 1200 approximately in 6 selected districts, the required minimum sample size was 292 after finite population correction (FPC). Presuming 20% non-response and midcourse dropout, final sample size was computed to be 351. However, the study was conducted among 352 Medical Officers.

Study tool

The study was undertaken with an identical semi-structured, pre-tested and validated 25-item questionnaire (Cronbach's alpha >0.8) covering different levels of cognitive domain, with a maximum possible score of 100 marks. In this self-administered questionnaire, there was no provision for negative marking.

Study technique and methods of data collection

An one-day six-hours training was conducted among selected trainees in phased manner at each district head

quarter. The training was delivered by the Principal Investigator (PI) who was an accredited trainer having participated in the Certified Training of Trainers (TOT) programme on 26th and 27th of April, 2018 at state head quarter. Pre and Post training assessment surveys were done on the same day to the training programme.

Ethics

Trainings were conducted on written orders from the State Health Directorate and informed consent was taken from each of the participants.

RESULTS

Age of the participants was 31±6.5 years (mean±SD); 197 (55.96%) were male and rest 155 (44.03%) were female. Among 352 participants, 324 had MBBS qualification, among the rest, 19 had post graduate diploma and 9 were found to hold post graduate degree in any discipline. Average work experience of the M.O.s was 7.2±1.1 years. Mean±SD of post and pre-test scores were 77±23.5% and 34±12.9% respectively.

Dependent sample t-test showed significant difference between post and pre-test scores with $p<0.000$ (Table 1). Negative correlation ($r=-0.474$) between post-test and pretest scores were observed, which was statistically significant ($p<0.000$) indicating unmet training needs.

One way repeated measures Test was done using General Linear Model was done with time in the horizontal axis (over which pre-test and post-test scores were measured). "F" values were highly significant (<0.001) as seen in Pillai's Trace, Wilk's Lambda etc. Partial Eta Squared values being 0.919, implying that 91.9% of the variation between pre-test and post-test scores could be explained by "the training" (Table 2). Greenhouse-Geisser, Huynh-Feldt and lower-bound reflected highly significant "F" values with $p<0.000$; here Sphericity cannot be computed as only two levels were compared over time. Multivariate (repeated measures) tests, using Bonferroni pairwise comparisons also revealed highly significant "F" values with $p<0.000$.

Univariate (GLM) with pretest baseline score as Covariate was conducted and significant "F" and partial eta square reflecting unmet training needs (Table 3).

Table 1: Distribution of scores by dependent sample t-test.

Mean	SD	95% C.I.		t	Sig.(2-tailed)
		Lower	Upper		
41.165	12.233	39.882	42.447	63.134	0.000

Table 2: GLM-repeated measures analysis with time.

	F	Sig.	Partial eta squared
Pilli's trace	3985.87	0.000	0.919
Wilk's Lambda			

Table 3: Univariate (GLM) with Pretest baseline score as Covariate.

	Mean square	F	Sig.	Partial eta squared
Corrected model	39247.68	1034.49	0.000	0.747
Intercept	147424.54	3358.64	0.000	0.906
Pre-test	39247.69	1034.9	0.000	0.747

Table 4: Comparison between pretest scores, gain in score after training and residual gap even after receipt of training.

	Pre-test score%	Gain in score after training	Residual gap between maximum marks and post-test score (%)
Mean	33.5000	41.1648	25.3352
N	352	352	352
SD	7.25914	12.23307	6.98726

P value often depends on sample size, and even small differences in means result in statistically significant values, which may not carry any practical impact insofar as program management is concerned. Hence, Cohen's "d" is important; Cohen's "d" = $t/\sqrt{N}$ =63.134/$\sqrt{352}$= 3.365. Thus as per accepted convention, the "effect size"

of these series of training programs are highly effective ("Huge") as modified later on by Sawilowaky's addition.

The residual gap even after receipt of training was found to be >25% which reiterates the needs of periodic re-training (Table 4).

DISCUSSION

The age of the current study participants was in accordance to the study by Ainapure et al from Karnataka.[7] In contrast to the current study, the above mentioned study was conducted among all the levels of stakeholders for NPCDCS programme implementation.[7] Regarding mean±SD of the pre and post-test scores, the current study had supporting evidence from the study by Framtz about risk factors of NCDs among common learners.[8] Similar findings were also there in study by Choudhari et al from Gujarat.[9] Similar to the current study, Liang et al also showed significant improvement as evident in post-training programme among students regarding life-effectiveness factors (<0.001).[10] Alessandri et al by Structural Equation Modelling Approach also showed effectiveness of intervention by significant improvement of post-test scores.[11] Dauer et al had also similar findings regarding training intervention among nurses on radiation safety.[12] Training efficacy as evident in the current study had also been emphasized by Muthén and Curran (1997).[13] Similar findings were also there in studies by Dauar LT from New York City and also from a school-based study from Saudi Arabia.[12] Somewhat in contrast to these, Caprara et al. emphasized effects of external variables as moderators.[14] Knowledge gap, as evident in the current study had no comparative literature on extensive research.

CONCLUSION

Despite the fact that, none of the medical officers had work experience of not less than 5 years, but baseline working knowledge regarding NCD was dismal. After six hours of training, the improvement of on-site knowledge was significant as evidenced by scores. Residual knowledge gap needs to be addressed through periodic refresher training in future.

Limitation of the study

As the current study was conducted among six districts of West Bengal, extrapolation of findings might be erroneous for the other districts. As the post-training test was conducted within very short time gap, assessment might be based on rote memory. A future study with a minimum time gap of 1 month may be better to assess actual knowledge gain.

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