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Research article

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Effect of verbal encouragement and visual biofeedback on peak expiratory flow rate in healthy young subjects

Ms.Dipali Rana

Senior Lecturer, Khyati institute of physiotherapy, Shahibaug, Ahmedabad, Gujarat, India.

*Corresponding Author: Ms.Dipali Rana

Email id: drdipalirana@gmail.com

ABSTRACT

Background & Aim of study

Peak expiratory flow rate is simple and common method of measuring airway obstruction. The aim of this study is to find out the effects of verbal encouragement and visual biofeedback during the performance of peak expiratory flow.

Methodology

60 Healthy young subjects, first and second year bachelor of physiotherapy (B.P.T.) students of Charotar institute of physiotherapy, Changa, Gujarat were selected. Students were briefly stated about the nature and intervention of the study and informed consent were taken. The method of peak expiratory flow was demonstrated to all subjects.

After checking for inclusion and exclusion criteria, participants were randomly selected and assigned to two different orders of peak expiratory flow rate (PEFR) assessments. Each subject went through peak expiratory flow rate assessments including with an intervention (verbal encouragement and visual biofeedback) and without the intervention (without verbal encouragement and visual biofeedback). Outcome measure: Peak expiratory flow rate by peak flow meter.

Result

Results shows a significant difference in PEFR with p value < 0.0001. Without intervention PEFR - Mean \pm SD = 290.50 \pm 91.270. With intervention PEFR - Mean \pm SD = 341.67 \pm 85.552.

Conclusion

The efficiency and reproducibility of peak expiratory flow can be affected by verbal encouragement and visual biofeedback during PEFR measurements.

Keywords: Peak expiratory flow rate, Verbal encouragements, Visual biofeedback.

INTRODUCTION

In this era of evidence based practice, measurement is fundamental to science. In medicine measurement underpins most clinical decisions. Peak expiratory flow rate (PEFR) as a measurement of ventilatory function was introduced by Hadron in 1942 [1]. It is an

important lung function test to check for airway obstruction and for the effective treatment of asthma. Ambulatory recording of PEF provides an objective day to day measure of airway obstruction and is one of the most commonly reported physiologic outcome variable in clinical trials [2].

Soutar et al found some correlation between PEFR rhythm and urinary catecholamine excretion in asthmatics [3]. Apart from widely used in asthmatics, PEFR has been used as important measurement tool in other research work also. Jain SK, Kumar R concludes in their study that low socio-economic condition or over crowded area of residence was found to decrease PEFR. He also concludes that smokers were found to have significant lower values of PEFR in comparison to non-smokers [4].

Brancazio et al stated in their study that PEFR in pregnancy is valid and physician can use peak flow meter accurately and reliably in the measurement of pregnant women with asthma [5]. Debry P, Shreenasta stated in their study that PEFR measurement is the easiest and cheapest method to evaluate respiratory function in different conditions [6]. The wright's mini peak flow meter has been used universally to measure PEFR. Mini peak flow meter is easy to clean, lightweight, portable and affordable. It is widely used and suitable for both home and clinical use, also suitable for most adults and children [7]. In European taskforce guidelines Miller et al (2005) highlighted that the measurement of PEFR is depends on effort and technique [8]. It is known that motivation is essential not only for learning but also for efficient performance of motor task [9]. Imagery, proprioceptive training and biofeedback technique such as verbal encouragement and visual feedback are frequently utilized for performance enhancement [10].

Though mini peak flow meter is widely used to measure PEFR, the lack of research regarding how PEFR react to visual feedback and verbal encouragement warrants further investigation. So, the present study aimed to find out effects of verbal encouragement and of visual biofeedback on PEFR.

AIM OF STUDY

The aim of this study was to assess the effect of verbal encouragement and visual biofeedback on PEFR in healthy young subjects.

Hypothesis

The verbal encouragement and visual biofeedback have effect on PEFR in healthy young subjects.

Null hypothesis

The verbal encouragement and visual biofeedback do not have effect on PEFR in healthy young subjects.

Methodology

Study design: experimental cross sectional study

Sampling: random sampling

Sample size: 60

Inclusion criteria

Healthy subjects between 17-20 years of either sex, who are able to comprehend commands/visual biofeedback and willing to participate

Exclusion criteria

Presence of any recent illness, smokers, asthmatics and subjects who had received regular use or guidance on technique with PEFR.

Materials

Pulmopeak mini peak flow meter (60 to 900 liters/minute-EU scale), weighing machine, height measure scale, chair, pen and data collection sheet

Procedure

Volunteers from first and second year B.P.T students of Charotar institute of physiotherapy, changa, Gujarat were taken into study after finding their suitability as per inclusion and exclusion criteria. An informed consent was taken from them. All the participants received an initial instructional session on the PEFR technique which includes demonstration of PEFR. Then the subjects were randomly selected and each one went through non-intervention assessment session (without verbal encouragement and visual biofeedback). Assessment was performed in quite room to prevent any distraction. The subject was positioned on a chair with a fixed back and seat allowing a hip flexion angle of 90°. In mini peak flow meter the pointer was set at zero and subject was asked to take a deep breath, close the lips firmly around the mouth piece then asked to blow as hard and fast as they can.

At the end of attempt researcher checked the pointer and took the reading. The whole procedure was done 3 times and highest reading was recorded. Subject was not allowed to see the reading after each attempt. (Hiding the scale with micro pore tap-for the confirmation on technique)

Then the same subject went through the intervention session (with verbal encouragement and visual biofeedback). In this the researcher

provided standardize verbal encouragement phrase at a raised voice volume and subject was allowed to see the reading after each attempts.

VERBAL ENCOURAGEMENT PHRASES WITH VISUAL BIOFEEDBACK

| | |
|--------------------------|---|
| Prior to the performance | Remember to blow as forcefully and hard as you can |
| During the performance | Try hard-keep going |
| After the performance | Performance specific advise-showing the pointer of PEFR and advice to try to get more in next effort. |

The whole procedure was repeated 3 times and highest reading was recorded. All participants were given the opportunity to rest between each attempt.

Outcome measure: Peak expiratory flow rate

STATISTICAL ANALYSIS

Data were analyzed by paired t-test .Level of significance was $p < 0.05$

RESULT

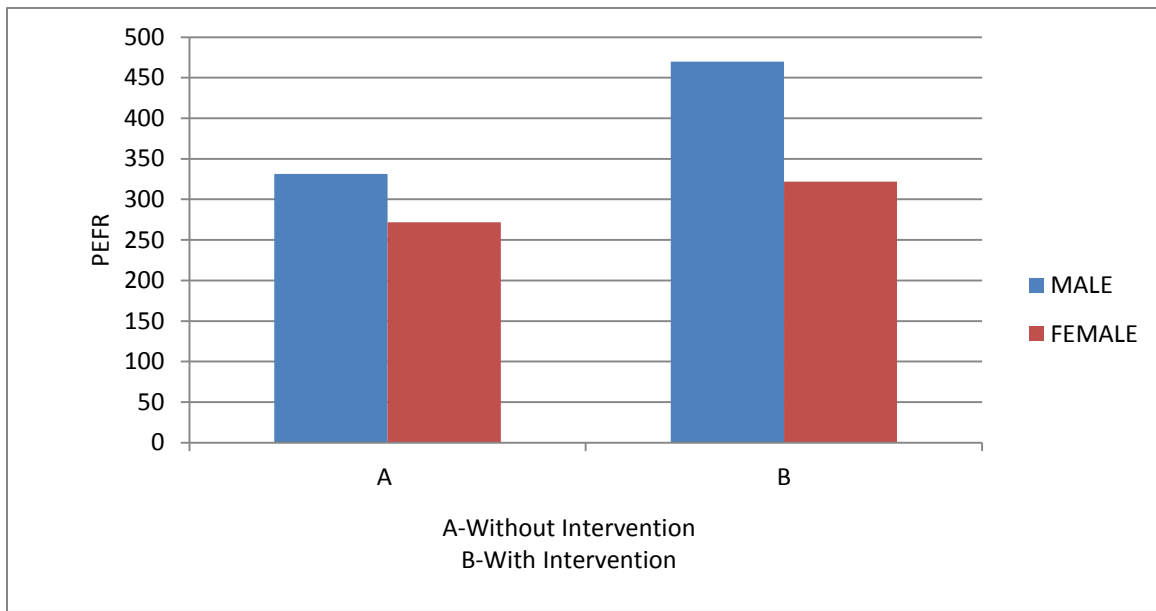
Table-1, Characteristics of Subjects

| CHATACTERISTICS OF SUBJECTS | MEAN ± SD |
|-----------------------------|--------------|
| Sex M/F | 8/52 |
| Age (years) | 18.03±0.78 |
| Height (cm) | 159.23±7.72 |
| Male: | 170±7.85 |
| Female: | 157.57±6.29 |
| Weight (kg) | 50.38±10.57 |
| Male: | M-58.5±12.62 |
| Female: | F-49.13±9.76 |

Table -2, Pefr Data of 60 Subjects

| GROUP | NO.OF SUBJECTS | PEFR MEAN±SD | P VALUE |
|-------|----------------|-----------------|----------|
| A | 60 | 290.50±91.270 | < 0.0001 |
| B | 60 | 341.67±85.552 | |

Graphical presentation of mean values of PEFR



A-without intervention B-with intervention
 As p value is < 0.05, highly significant difference present

Table-2 PEFR Data of Male/Female

| GROUP | GENDER | PEFR MEAN±SD | P VALUE |
|-------|--------|-----------------|---------|
| A | M(8) | 331.5±143.69 | 0.0665 |
| B | M(8) | 470±97.39 | |
| A | F(52) | 271.73±73 | <0.0001 |
| B | F(52) | 321.92±64.69 | |

DISCUSSION

In the current study the results indicate verbal encouragement and visual biofeedback are effective in increasing PEF in healthy young subjects.

One group of authors, through the mapping of the brain regions involved in processing of positive and negative stimuli demonstrate that emotionally charged stimuli have a strong modulatory effect on the cortex and on the subcortical structure. In this study, Verbal encouragement was delivered at a raised voice volume combined with visual biofeedback with positive and performance specific messages. So, the increase PEFR may be due to this strong modulatory effect.

Brian and Carl stated in their study that visual feedback has the potential of improving performance and increasing effort of user during rehabilitation exercise and verbal encouragement

can increase performance by 39%, which can correlate with this study.

In this study, mean PEFR of female shows statistical significant difference while mean PEFR of male shows border line significance difference which may be due to small sample size.

This study shows that verbal encouragement and visual feedback have influence on PEFR, this should be consider as important point during the procedure of PEFR for the standardization of technique. Though data shows highly significant difference, it is failed to explain either the difference is due to verbal encouragement or visual biofeedback. So, further investigation is required with either verbal encouragement or visual feedback, with equal number of gender and with large number of sample size.

The use of positive reinforcement during vital capacity measurement proven to be an effective

strategy as the patient self esteem and co-operation can increase. So, further investigation required to find out effect of verbal encouragement and visual feedback on PEFR in patients.

CONCLUSION

The finding of current study supports the effectiveness of verbal encouragement and visual

biofeedback on PEFR in healthy young subjects. Though as an effective tool for assessing ventilatory function, PEFR parameter is entirely effort dependent which results in high intra subject variability. So, verbal encouragement and visual biofeedback during the PEFR procedure carried a lot importance.

REFERENCES

- [1]. M.B.Diksit ,S.Raje and M.J.Agrawal. Lung function with spirometry: An ondial perspective- peak expiratory flow rates. Indian J.physiol phatmacol. 49(1), 2005, 8-18
- [2]. Helen K.Reddel , D.Robin Taylor et al .An official American thoracic society /European respiratory society statement: Asthma control and exacerbation. American journal of respiratory and critical care medicine 180, 2009, 59-99
- [3]. Souter et al. Pulmonary clock.International journal of respiratory medicine-Thorax. 36, 1981, 481-6
- [4]. Jain SK, Kumar R et al .Factors influencing peak expiratory flow rate in normal subjects-II. Lung India, 1(3), 1983, 92-7
- [5]. L.R Broncazio , SALaifer et al .Peak expiratory flow rate in normal pregnancy .Obstet gynecol. 89(3), 1997, 383-6
- [6]. Debray P,Shreevasta BM et al .A comparative study of the peak expiratory flow rate of Indian and Nepalese young adults in a teaching institute. JNMA J Nepal Med Assoc. 47(169), 2008, 7-11
- [7]. B Mckenzie, et al. Accuracy of peak flow meters don't interchange devices. BMJ. 308, 1994, 917
- [8]. Roberta Bullett et al .The effect of two teaching strategies on peak flow meter value and consistency in a healthy population: A single blinded randomized study. The plymouth student journal of health and social work. 2, 2010, 30-39
- [9]. Vanessa and Erili et al. Impact that positive reinforcement during spirometry has on the measurement of VC in healthy volunteers.J.bras.pneumol. 36, 2010, 2
- [10]. Brian Campenella et al. Effect of visual feedback and verbal encouragement on concentric quadriceps and hamstring peak torque of males and females. Isokinetic and exercise science.2000, 1-6.

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