

The Effect of Preoperative Chest Physiotherapy on Oxygenation and Lung Functions Among Cardiac Surgery Patients: A Randomized Controlled Study

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OBJECTIVES

This study aimed to assess the preoperative chest physiotherapy effects of on oxygenation and lung functions among patients undergoing open heart surgeries.

METHODS

A randomized controlled study was made at the Clinical Centre, Heart Institute, University of Pécs, Hungary. This study was conducted in the period between 04.2019 and 10.2019. 100 adult patients with planned open heart surgery were blindly and randomly allocated into two groups by using prepared opaque sealed envelopes, containing either number 1 or number 2; one group included patients who underwent the intervention in the form of home chest physiotherapy program for one week preoperative in addition to the traditional postoperative program, and the other group included patients who underwent only the traditional postoperative program. Exclusion criteria were Patients with a history of strokes, musculoskeletal disorders, or psychological disorders. The numerical data were presented as mean (standard deviation), while the categorical data were presented as a percentage. Chi-square test, T-test (unpaired) and ANOVA test were performed with the help of the SPSS 22.0 and (P<0.05).

RESULTS

A total of 100 people underwent open heart surgery were included in the trial and had preoperative chest physiotherapy (n = 45) or not (n = 55) .The patients' age ranged between 40 and 83 years. The main type of operation in the study patients was coronary artery bypass graft (64%). No significant differences were noted between both study groups in the preoperative outpatient clinic and day 0 respiratory functions measurements (FVC, FEV1)or O2 saturation (P > .05), while Significant differences regarding the same measures in the postoperative 7 days measurements (P<0.05) were evident. The postoperative hospital stay length ranged from 7 to 20 days, with a high significant increase noted in group 2.

CONCLUSIONS

Preoperative chest physiotherapy is effective in improving respiratory functions following the open heart surgery.

Characteristics		Group 1 45		Group 2 55		X ²	P
Age(years)		N	%	N	%	.15	.99
40 - <51		2	4.4	3	5.5		
51 - <62		10	22.2	11	20		
62 - <73		20	44.4	24	43.6		
73- 83		13	28.9	17	30.9		
Gender							
Male		28	62.2	33	60	.05	.82
Female		17	37.8	22	40		
Weight(kg)						.06	.97
47- <70		13	28.9	16	29.1		
70-<93		23	51.1	27	49.1		
93- 114		9	20	12	21.8		
Height(cm)							
150-< 162		11	24.4	13	23.6	.01	.99
162-< 174		22	48.9	27	49.1		
174- 185		12	26.7	15	27.3		
BMI							
Normal weight		11	24.5	11	20	2.02	.57
Overweight		22	48.8	25	45.45		
Obese		8	17.9	16	29.1		
Extreme obese		4	8.8	3	5.45		
Previous Diseases							
Hypertension		25	55.6	36	65.45	1.02	.31
Diabetes		15	33.4	16	29.1	.12	.74
COPD		5	11.1	10	18.18	.97	.32
Pulmonary Fibrosis		2	4.4	1	1.82	.59	.44
Chronic Bronchitis		3	6.7	10	18.18	2.9	.09
Smoking							
Yes	Current smokers	9	20	17	30.9	2.49	.11
	Ex-smokers	3	6.7	6	10.9		
No		33	73.4	32	58.2		
Type of surgery							
CABG	On-pump	25	62.2	30	65.45	.4	.82
	Off-pump	3		6			
Valve surgery		13	29	13	23.55		
CABG + Valve surgery		4	8.8	6	10.9		

Table 1. Clinical and demographic characteristics (n=100).

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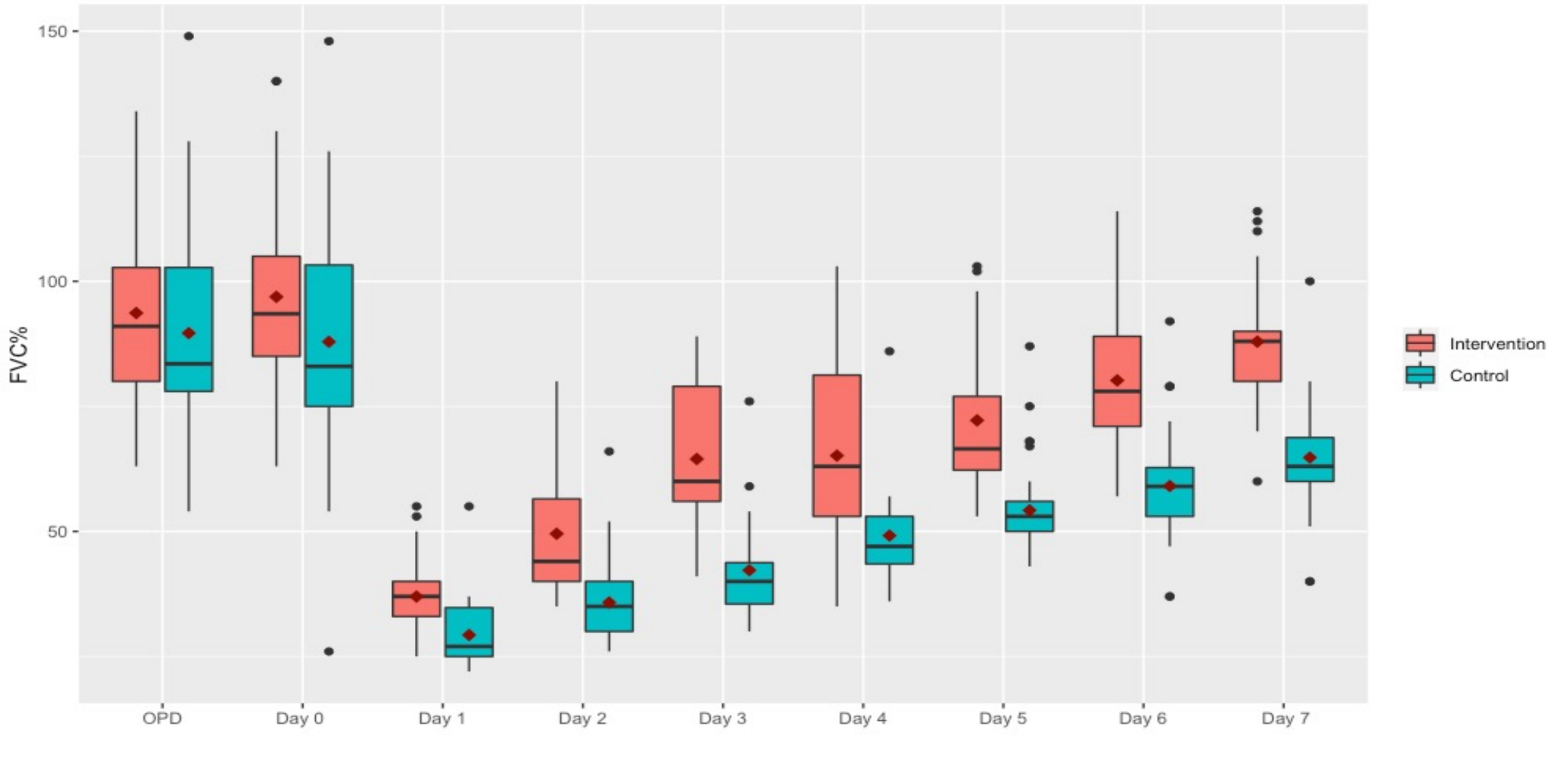


Figure 1. Median, interquartile range and mean (red diamond) of forced vital capacity (FVC%) in the intervention and control groups.

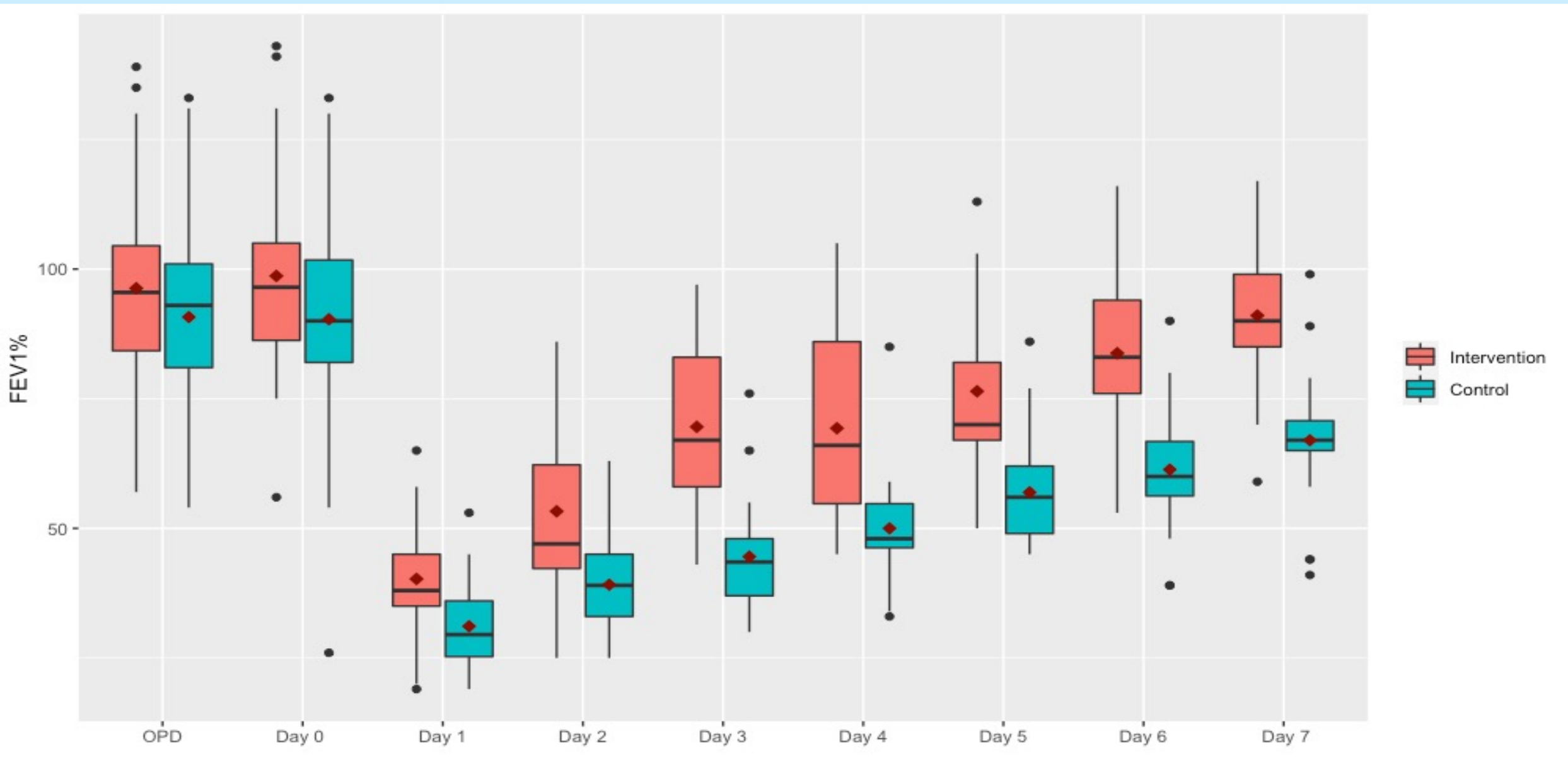


Figure 2. Median, interquartile range and mean (red diamond) of forced expiratory volume in first second (FEV1%) in the intervention and control groups.

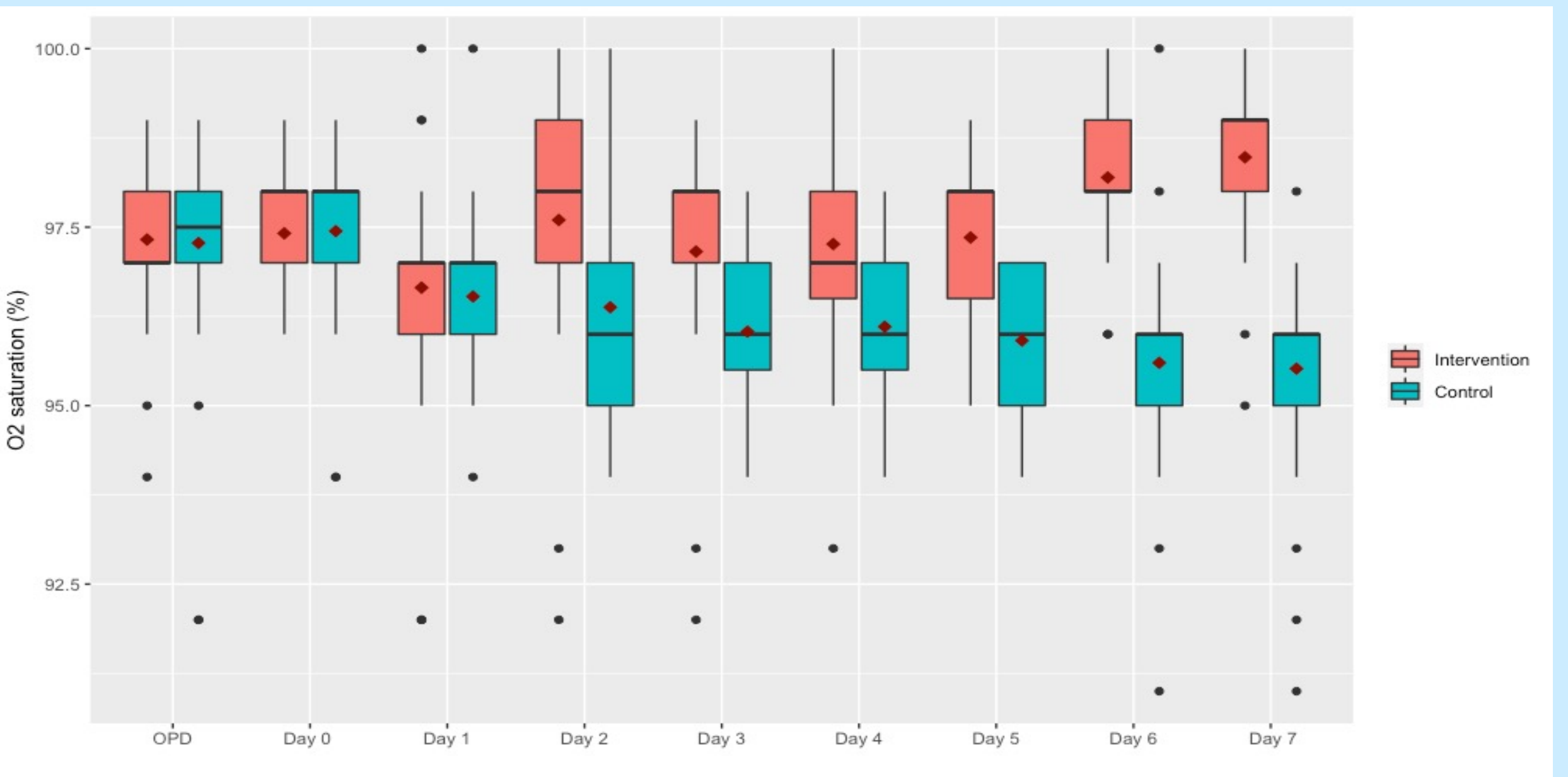


Figure 3. Median, interquartile range and mean (red diamond) of O2 saturation (%) in the intervention and control groups.

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