Multidisciplinary education with a focus on COPD in primary health care

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ABSTRACT

Objective: To evaluate the use of video lessons on the topic of COPD as a training tool for a multidisciplinary team working in the primary health care sector. **Methods:** This was a quasi-experimental study involving a multidisciplinary team working at a primary health care clinic. The level of knowledge about COPD was measured by applying a specific, 16-item questionnaire - before, immediately after, and three months after the video lessons. In a set of six structured video lessons, the training focused on the prevention, case-finding, treatment, and monitoring of cases of COPD. The data were analyzed with the Friedman test, the Kruskal-Wallis test, Tukey's post hoc test, Dunnett's test, and the Bonferroni test. **Results:** There was a significant difference between the periods before and immediately after the training in terms of the scores on 15 of the 16 items on the questionnaire regarding the level of knowledge about COPD. The median total score of the participants increased significantly, from 60 points before the training to 77 points immediately thereafter and 3 months thereafter (p < 0.001 for both). Before the training, 23 (63.9%) and 13 (36.1%) of the members of the multidisciplinary team presented strong and very strong levels of agreement, respectively, among the 16 questionnaire items. After the training, 100% of the individuals presented a very strong degree of agreement. **Conclusions:** Multidisciplinary education through video lessons increased the knowledge of COPD on the part of a primary health care team, and the knowledge acquired was retained for at least three months after the intervention.

Keywords: Instructional films and videos; Pulmonary disease, chronic obstructive; Inservice training; Primary health care; Education, medical.

INTRODUCTION

COPD is a highly prevalent condition in people over 40 years of age.[1] However, it is still underdiagnosed[2] in Brazil. One of the possible reasons for this is the low level of knowledge about COPD among primary health care professionals and patients.[3,4]

Reducing the inequalities that result from the very diverse and heterogeneous levels of knowledge and training among members of multidisciplinary primary health care teams is a challenge.[5-7] In order to overcome this challenge, one may use video lessons, an educational multimedia tool that includes images and narration of text in the format of short videos to be used in a safe and controlled learning environment.[8,9] However, to the best of our knowledge, this tool has not yet been used for teaching primary health care professionals about COPD. Therefore, the objective of the present study was to evaluate the use of video lessons as a tool for training a multidisciplinary primary health care team on COPD.

METHODS

This was a quasi-experimental study carried out at the *Centro de Saúde da Família Leste Universitário, Distrito Sanitário Campinas Centro*, located in the city of Goiânia, Brazil. The study was approved by the Research Ethics Committee of the Federal University of Goiás under protocol number 857.082/14.

Inclusion and exclusion criteria

Primary health care professionals were included in the study, and visually- and/or hearing-impaired professionals who would not be able to watch the video lessons and read the knowledge assessment instrument were excluded, as well as those who did not have time to participate in the sessions. We have chosen primary health care professionals for the territorial coverage of their work and convenience.

The instrument used to measure the level of knowledge of the multidisciplinary team was the *Questionário de Conhecimentos sobre a Doença Pulmonar Obstrutiva Crônica na Atenção Primária* (QAP-DPOC, Questionnaire about Knowledge on Chronic Obstructive Pulmonary Disease in Primary Health Care).[10] The QAP-DPOC was applied at three different time points: before, immediately after, and three months after the training sessions, with no interference by the evaluator. After the first application of the questionnaire, the training sessions began in a quiet room.

Video lessons

The video lessons were filmed and edited by professionals of the *Núcleo de Telemedicina e Telessaúde* of the *Universidade Federal de Goiás* in Goiânia. A digital camcorder (Panasonic do Brasil, Manaus, Brazil), a tripod, and Adobe Connect software (Adobe System, San Jose, CA, USA) were used for recording; for editing, the Camtasia Studio 8 software (TechSmith, Okemos, MI, USA) was used on a personal computer. The video lessons were made available on DVD and, on the scheduled day, were shown at the *Centro de Saúde da Família* by means of an audiovisual device. A facilitator remained in the classroom to discuss any topics addressed by the lessons that might need clarification.

The telehealth platform of university was used to store the video lessons and make them available, should the professional wish to watch them again (http://www.tele.medicina.ufg.br/).

The training consisted of six video lessons taught by an instructor with experience in the subject matter, with the following themes (duration): management of patients with respiratory symptoms (21'30"); case-finding of patients at risk of COPD (16'00"); smoking cessation (20'23"); physical exercise for COPD patients (14'40"); referral, counter-referral, and clinical management of COPD exacerbations (14'45"); and guidance on the use of inhalers, vaccines, and oxygen therapy for COPD (32'13"). The video lessons addressed the topics of prevention, case-finding, treatment (pharmacological and nonpharmacological), and monitoring of COPD. It is important to note that the QAP-DPOC is not aimed at pulmonologists, but at multidisciplinary primary health care teams.[10]

Statistical analysis

The Shapiro-Wilk normality test was used to verify the distribution of the data. The continuous quantitative variables were presented as means, standard deviations, medians, and 95% CIs. The Friedman test was used to analyze the answers before, immediately after, and three months after the training provided. The Kruskal-Wallis test was used in order to compare the level of knowledge among the professionals. For greater accuracy in the detection of significant differences, Tukey's *post hoc* multiple comparisons test and Dunnett's test were used. The Bonferroni correction was used to prevent type I errors. For all situations, a significance level of 5% was used.

RESULTS

Thirty-eight primary health care professionals were considered eligible for the study. Two individuals did not complete the protocol and were excluded from the final analysis. Of the total of 36 participants, 30 (83.3%) were female. In the sample as a whole, 9 participants (25.0%) were community agents; 8 (22.2%) were nurses; 6 (16.7%) were nursing assistants; 6 (16.7%) were physicians; and 7 (19.4%) were dentists. As for the level of education of the participants, 11 (30.6%) had a high school diploma; 4 (11.1%) had some college education; 10 (27.8%) had an undergraduate degree; 1 (2.8%) had some graduate education; and 10 (27.8%) had a graduate degree. The age ranged from 24 to 75 years (mean = 40.2 ± 12.3 years). The average time as a member of a multidisciplinary team working in primary health care was 128.5 ± 118.5 months.

The professionals who checked the "agree" option before the training, checked the "fully agree" option immediately after the sessions for most of the questions (11 items; 68.8%; Table 1). Comparing the answers provided before and immediately after the training, there was an increase in the rate of correct answers to the 16-item questionnaire, which was maintained at the evaluation performed three months later ($p < 0.05$). Answers considered correct are shown in Table 1. A 75% agreement with the correct answer in a specific item of the questionnaire was considered "right". Item 7 presented significant differences in all comparisons (Table 2).

The questionnaire has a minimum score of 16 points, which indicates a low level of knowledge about COPD, and a maximum score of 80 (highest level of knowledge). The median score of the participants in the questionnaire increased from 60 before the training to 77 immediately thereafter and three months thereafter ($p < 0.001$ for both). The mean score also increased immediately after the training, and it was kept the same three months thereafter.

Before our intervention, there was greater score dispersion among the participants, whereas immediately after the training and three months thereafter, there were only one and four outliers below the median score, respectively, which did not influence the final result. After the intervention, the homogeneity of the results (level of knowledge) clearly increased (Figure 1).

Prior to the training, 23 (63.9%) and 13 (36.1%) of the members of the multidisciplinary team presented strong and very strong degrees of agreement in the 16 items of the questionnaire, respectively. After the training, 100% of the individuals presented a very strong degree of agreement.

We compared the level of knowledge among the different professionals of the primary health care team before the training. We found out that community agents and nursing technicians were the ones with the lowest levels of knowledge when compared with physicians ($p < 0.05$). After the training, there were no differences in the level of knowledge among the different professionals. Three months after the training, community agents presented a more significant reduction in their level of knowledge when compared with nurses ($p < 0.05$). The results are shown in Table 3.

Table 1. Absolute values and proportions of participants from a multidisciplinary primary health care team (N = 36) who have checked each response in the Questionnaire about Knowledge on Chronic Obstructive Pulmonary Disease in Primary Health Care at three different time points, means, standard deviations, medians, and 95% CIs of the scores in the general sample.

Response per item	Participants, n (%)					Scores	
	1 Strongly disagree	2 Disagree	3 Undecided	4 Agree	5 Strongly agree	Mean ± SD	Median (95% CI)
1) Being a smoker/former smoker is not a risk factor for COPD.							
1-A	22 (61.1)[a]	9 (25.0)	1 (2.8)	0 (0)	4 (11.1)	1.75 ± 1.27	1.00 (1.31-2.18)
1-B	30 (83.3)[a]	5 (13.9)	0 (0)	0 (0)	1 (2.8)	1.25 ± 0.73	1.00 (1.00-1.49)
1-C	30 (83.3)[a]	5 (13.9)	0 (0)	0 (0)	1 (2.8)	1.5 ± 0.73	1.00 (1.00-1.49)
2) The leading causes of COPD are cigarette smoking and wood stove smoke.							
2-A	1 (2.8)	3 (8.3)	1 (2.8)	21 (58.3)	10 (27.8)[a]	4.00 ± 0.95	4.00 (3.76-4.32)
2-B	0 (0)	0 (0)	0 (0)	5 (13.9)	31 (86.1)[a]	4.86 ± 0.35	5.00 (4.74-4.97)
2-C	0 (0)	0 (0)	0 (0)	3 (8.3)	33 (91.7)[a]	4.92 ± 0.28	5.00 (4.82-5.01)
3) Counseling for approximately 3 to 10 minutes can help patients quit smoking.							
3-A	5 (13.9)	7 (19.4)	6 (16.7)	14 (38.9)	4 (11.1)[a]	3.13 ± 1.26	3.50 (2.70-3.56)
3-B	2 (5.6)	0 (0)	0 (0)	3 (8.3)	31 (86.1)[a]	4.69 ± 0.95	5.00 (4.37-5.01)
3-C	1 (2.8)	0 (0)	3 (8.3)	6 (16.7)	25 (72.2)[a]	4.56 ± 0.87	5.00 (4.25-4.85)
4) Group counseling is not a primary health care action aimed at assisting patients undergoing a critical smoking withdrawal phase.							
4-A	16 (44.4)[a]	14 (38.9)	3 (8.3)	2 (5.6)	1 (2.8)	1.83 ± 1.00	2.00 (1.49-2.17)
4-B	32 (88.9)[a]	1 (2.8)	0 (0)	0 (0)	3 (8.3)	1.36 ± 1.12	1.00 (0.98-1.74)
4-C	31 (86.1)[a]	4 (11.1)	0 (0)	0 (0)	1 (2.8)	1.22 ± 0.72	1.00 (0.97-1.46)
5) Magazines and booklets are ways to educate COPD patients about their health care.							
5-A	0 (0)	0 (0)	3 (8.3)	20 (55.6)	13 (36.1)[a]	4.27 ± 0.61	4.00 (4.06-4.48)
5-B	0 (0)	0 (0)	0 (0)	2 (5.6)	34 (94.4)[a]	4.94 ± 0.23	5.00 (4.86-5.02)
5-C	0 (0)	0 (0)	0 (0)	5 (13.9)	31 (86.1)[a]	4.86 ± 0.35	5.00 (4.74-4.97)
6) COPD symptoms appear slowly and progressively.							
6-A	0 (0)	0 (0)	3 (8.3)	21 (58.3)	12 (33.3)[a]	4.25 ± 0.60	4.00 (4.04-4.45)
6-B	0 (0)	0 (0)	0 (0)	4 (11.1)	32 (88.9)[a]	4.88 ± 0.31	5.00 (4.78-4.99)
6-C	0 (0)	0 (0)	0 (0)	5 (13.9)	31 (86.1)[a]	4.86 ± 0.35	5.00 (4.74-4.97)
7) Frequent cough is a symptom of COPD.							
7-A	1 (2.8)	6 (16.7)	12 (33.3)	14 (38.9)	3 (8.3)[a]	3.33 ± 0.95	3.00 (3.01-3.65)
7-B	0 (0)	0 (0)	0 (0)	3 (8.3)	33 (91.7)[a]	4.91 ± 0.28	5.00 (4.82-5.01)
7-C	0 (0)	1 (2.8)	1 (2.8)	9 (25.0)	25 (69.4)[a]	4.61 ± 0.68	5.00 (4.37-4.84)
8) Influenza and pneumonia vaccines do not reduce the number of COPD exacerbations.							
8-A	7 (19.4)[a]	14 (38.9)	6 (16.7)	7 (19.4)	2 (5.6)	2.52 ± 1.18	2.00 (2.12-2.92)
8-B	26 (72.2)[a]	6 (16.7)	0 (0)	1 (2.8)	3 (8.3)	1.58 ± 1.20	1.00 (1.17-1.99)
8-C	28 (77.8)[a]	3 (8.3)	1 (2.8)	2 (5.6)	2 (5.6)	1.53 ± 1.15	1.00 (1.13-1.91)
9) The use of oxygen in COPD patients will cause dependence.							
9-A	6 (16.7)[a]	17 (47.2)	8 (22.2)	5 (13.9)	0 (0)	2.33 ± 0.92	2.00 (2.02-2.64)
9-B	29 (80.6)[a]	6 (16.6)	0 (0)	0 (0)	1 (2.8)	1.27 ± 0.74	1.00 (1.02-1.52)
9-C	27 (75.0)[a]	8 (22.2)	0 (0)	1 (2.8)	0 (0)	1.31 ± 0.62	1.00 (1.09-1.51)
10) Practicing physical exercise can improve the autonomy and physical/social performance of COPD patients.							
10-A	0 (0)	1 (2.8)	0 (0)	22 (61.1)	13 (36.1)[a]	4.30 ± 0.62	4.00 (4.09-4.51)
10-B	0 (0)	0 (0)	0 (0)	2 (5.6)	34 (94.4)[a]	4.94 ± 0.23	5.00 (4.86-5.02)
10-C	0 (0)	0 (0)	0 (0)	4 (11.1)	32 (88.9)[a]	4.89 ± 0.31	5.00 (4.78-4.99)
11) As part of COPD treatment, it is important to talk about the myths and prejudices against the use of inhalers, oxygen therapy, and physical exercise.							
11-A	0 (0)	0 (0)	4 (11.1)	23 (63.9)	9 (25.0)[a]	4.13 ± 0.59	4.00 (3.93-4.33)
11-B	0 (0)	0 (0)	0 (0)	5 (13.9)	31 (86.1)[a]	4.86 ± 0.35	5.00 (4.74-4.97)
11-C	0 (0)	0 (0)	0 (0)	7 (19.4)	29 (80.6)[a]	4.81 ± 0.40	5.00 (4.66-4.94)

A: before the training; B: immediately after the training; and C: three months after the training. [a]Indicates the correct answer.

Table 1. Continued...

Response per item	Participants, n (%)					Scores	
	1 Strongly disagree	2 Disagree	3 Undecided	4 Agree	5 Strongly agree	Mean ± SD	Median (95% CI)
12) The right sequence for using inhaled medications is: 1) exhale normally, 2) place the mouthpiece in your mouth, 3) inhale deeply, 4) close your mouth and hold the air in your lungs for approximately ten seconds.							
12-A	1 (2.8)	2 (5.6)	16 (44.4)	8 (22.2)	9 (25.0)[a]	3.61 ± 1.02	3.00 (3.26-3.95)
12-B	0 (0)	0 (0)	0 (0)	5 (13.9)	31 (86.1)[a]	4.86 ± 0.35	5.00 (4.74-4.97)
12-C	0 (0)	0 (0)	3 (8.3)	3 (8.3)	30 (83.3)[a]	4.75 ± 0.60	5.00 (4.54-4.95)
13) The treatment of COPD includes: pharmacological and nonpharmacological therapy, education, and guidance on a healthy life style.							
13-A	0 (0)	1 (2.8)	1 (2.8)	22 (61.1)	12 (33.3)[a]	4.25 ± 0.64	4.00 (4.03-4.46)
13-B	0 (0)	0 (0)	0 (0)	3 (8.3)	33 (91.7)[a]	4.91 ± 0.28	5.00 (4.82-5.01)
13-C	0 (0)	0 (0)	0 (0)	4 (11.1)	32 (88.9)[a]	4.89 ± 0.31	5.00 (4.78-4.99)
14) The term "counter-referral" means: COPD patients referred to the primary health care center by a secondary or tertiary health care center, along with information on their diagnosis and treatment.							
14-A	0 (0)	0 (0)	15 (41.6)	10 (27.8)	11 (30.6)[a]	3.88 ± 0.85	4.00 (3.59-4.17)
14-B	0 (0)	1 (2.8)	1 (2.8)	1 (2.8)	33 (91.6)[a]	4.83 ± 0.60	5.00 (4.62-5.03)
14-C	0 (0)	0 (0)	0 (0)	3 (8.3)	33 (91.7)[a]	4.92 ± 0.28	5.00 (4.82-5.01)
15) When the health care team provides guidance on physical exercise to COPD patients, it is important to provide them with a scale to manage their shortness of breath.							
15-A	0 (0)	1 (2.8)	13 (36.1)	17 (47.2)	5 (13.9)[a]	3.72 ± 0.73	4.00 (3.47-3.97)
15-B	0 (0)	0 (0)	0 (0)	7 (19.4)	29 (80.6)[a]	4.80 ± 0.40	5.00 (4.55-4.94)
15-C	0 (0)	0 (0)	1 (2.8)	7 (19.4)	28 (77.8)[a]	4.75 ± 0.50	5.00 (4.58-4.91)
16) All patients who are diagnosed with COPD should be referred to a pulmonologist.							
16-A	1 (2.8)	5 (13.9)[a]	3 (8.3)	19 (52.8)	8 (22.2)	3.77 ± 1.04	4.00 (3.42-4.13)
16-B	7 (19.5)	26 (72.2)[a]	0 (0)	2 (5.5)	1 (2.8)	2.00 ± 0.82	2.00 (1.71-2.28)
16-C	3 (8.3)	26 (72.2)[a]	2 (5.6)	2 (5.6)	3 (8.3)	2.33 ± 1.01	2.00 (1.99-2.67)

A: before the training; B: immediately after the training; and C: three months after the training. [a]Indicates the correct answer.

DISCUSSION

Our findings show that the level of knowledge of the multidisciplinary primary health care team immediately after the training on COPD was higher than before the training, and that this knowledge was retained up to three months afterwards. The findings also indicate that the members of the team who held lower- and middle-level positions presented a greater knowledge deficit.

We found no studies regarding the use of video lessons to monitor the changes in the levels of knowledge among primary health care professionals in Brazil. Therefore, this study helps to determine the level of knowledge about COPD of primary health care professionals and to show how heterogeneous it is.

Two positive and pioneering aspects of the study were that it used video lessons as an educational tool for a multidisciplinary team whose members had different levels of education and training on COPD, and that it used a questionnaire that was specifically designed and validated to measure the level of knowledge of primary health care professionals on COPD. The questionnaire on COPD for primary health care professionals designed and validated for our study followed national and international recommendations.[11,12]

Our study reflects the level of knowledge of the population investigated so that it can be used as a baseline measure for future interventions in public health, making it possible to compare the levels of knowledge on COPD of multidisciplinary primary health care teams in different regions. The idea is to train different primary health care professionals without any sort of stratification, as this would prevent the training of a multidisciplinary team.

Two studies[8,9] used video lessons to investigate the use of different teaching methods with medical students and specialist physicians. Those studies consider video lessons a new pedagogical approach that can be used in order to improve this population's academic skills and self-confidence in providing care.

Fifteen of the 16 items of the QAP-DPOC showed significant differences between the moments before and immediately after the training; and 14 items did not show significant differences between immediately after the training and three months thereafter, the only exceptions were items 7 and 13. In item 7, immediately after the training, there was a shift from the option "fully agree" to the option "agree", which represented a significant difference; however, this was a small change and we do not believe it is clinically relevant.

Table 2. Results of the Friedman test comparing the responses to each item of the Questionnaire about Knowledge on Chronic Obstructive Pulmonary Disease in Primary Health Care.

Item	A	B	C	p[a]	p[b]	p[c]
		Score, mean ± SD				
1	1.75 ± 1.27	1.25 ± 0.73	1.25 ± 0.73	0.03	0.06	0.85
2	4.00 ± 0.96	4.86 ± 0.35	4.92 ± 0.28	< 0.001	< 0.001	0.48
3	3.14 ± 1.27	4.69 ± 0.95	4.56 ± 0.88	< 0.001	< 0.001	0.32
4	1.83 ± 1.00	1.36 ± 1.13	1.22 ± 0.72	< 0.001	< 0.001	0.48
5	4.28 ± 0.61	4.94 ± 0.23	4.86 ± 0.35	< 0.001	< 0.001	0.26
6	4.25 ± 0.60	4.89 ± 0.32	4.86 ± 0.35	< 0.001	< 0.001	0.71
7	3.33 ± 0.96	4.92 ± 0.28	4.61 ± 0.69	< 0.001	< 0.001	0.01
8	2.53 ± 1.18	1.58 ± 1.20	1.53 ± 1.16	< 0.001	< 0.001	0.59
9	2.33 ± 0.93	1.28 ± 0.74	1.31 ± 0.62	< 0.001	< 0.001	0.33
10	4.31 ± 0.62	4.94 ± 0.23	4.89 ± 0.32	< 0.001	< 0.001	0.32
11	4.14 ± 0.59	4.86 ± 0.35	4.81 ± 0.40	< 0.001	< 0.001	0.48
12	3.61 ± 1.02	4.86 ± 0.35	4.75 ± 0.60	< 0.001	< 0.001	0.33
13	4.25 ± 0.65	4.92 ± 0.28	4.89 ± 0.32	0.71	< 0.001	< 0.001
14	3.89 ± 0.85	4.83 ± 0.61	4.92 ± 0.28	< 0.001	< 0.001	0.48
15	3.72 ± 0.74	4.81 ± 0.40	4.75 ± 0.50	< 0.001	< 0.001	0.59
16	3.78 ± 1.05	2.00 ± 0.83	2.33 ± 1.01	< 0.001	< 0.001	0.56

A: before the training; B: immediately after the training; and C: three months after the training. [a]A vs. B. [b]A vs. C. [c]B vs. C.
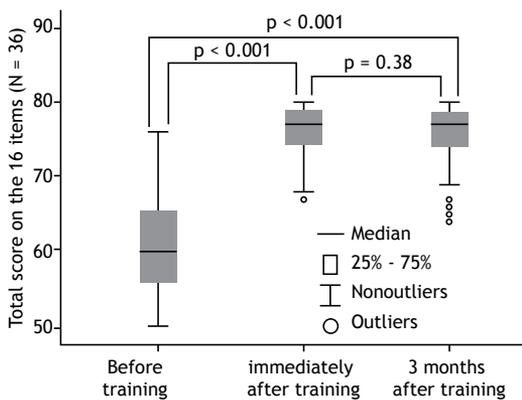

Figure 1. Box plot of the comparison of the total score on the 16-item Questionnaire about Knowledge on Chronic Obstructive Pulmonary Disease in Primary Health Care at the different time points (before, immediately after, and three months after the professional training with video lessons).

A study[13] evaluated the knowledge of people at risk of COPD and stated that 70% of smokers believed that the knowledge of primary health care physicians represented more than just a source of health advice when compared with advice given by family and friends, emphasizing the importance of the knowledge and conduct of primary health care professionals to educate patients and change their behavior.

It is particularly challenging to conduct studies on the COPD expertise of multidisciplinary primary health care teams because team members present very diverse levels of knowledge. The results of a study[3] and our findings indicate the need to train the multidisciplinary primary health care team in order to promote better community education action plans. This fact could, in an optimistic view, contribute to reducing the prevalence of smoking among young adults.[14]

A study[15] carried out in the Middle East and North Africa asked 1,392 patients to complete a questionnaire about their knowledge on COPD and satisfaction with the treatment they had been given. Overall, 58.6% of the patients stated they were properly informed about their respiratory condition; 66% reported having received information about COPD from their physician; 11% from television; 6% from the Internet; and below 1% from other health care professionals.[15] In that study, 47.5% of the individuals interviewed considered the physician important in managing respiratory symptoms and believed that the knowledge of physicians and other health care professionals created a closer and stronger professional-patient relationship. However, it is important to note that, in our field, plenty of useful primary health care information is provided by nonmedical professionals.[3] Therefore, there is no doubt that primary health care users have a knowledge gap about COPD and that this gap should be filled. Primary health care users could certainly benefit from the expansion of knowledge of their multidisciplinary team.

We clearly noticed that, after the intervention, there was an increase in the number of responses considered correct in the questionnaire. These results indicate that the knowledge that was demystified and imparted to primary health care professionals during the training on COPD can increase the transfer of educational information about the condition to the patients seen by these professionals. The authors of the aforementioned study[15] believe that the rate of COPD-related information transfer by other health care professionals (< 1%) should be overcome.

The frequency of responses considered correct three months after the training was superior to 50% for all

Table 3. Results of the test of multiple comparisons of the scores obtained on the Questionnaire about Knowledge on Chronic Obstructive Pulmonary Disease in Primary Health Care by type of health care professional at each of the three time points.

Time point	Primary health care professionals					p*
	Community agent	Dentist	Nurse	Physician	Nursing assistant	
	Total score, mean ± SD					
A	57.00 ± 5.17[†]	61.86 ± 5.52	61.75 ± 4.98	67.17 ± 6.49[††]	57.17 ± 4.17	0.02
B	74.67 ± 3.91	77.57 ± 2.07	77.63 ± 2.00	77.50 ± 2.43	72.67 ± 4.89	0.10
C	72.11 ± 5.67[¶]	75.71 ± 3.45	77.88 ± 1.36	77.00 ± 4.05	73.67 ± 3.93	0.03

A: before the training; B: immediately after the training; and C: three months after the training. *The Kruskal-Wallis test, followed by Tukey's post hoc test and Dunnett's test. [†]$p < 0.05$ between community agents and physicians. [††]$p < 0.05$ between nursing assistants and physicians. [¶]$p < 0.05$ between community agents and nurses.

items, which shows that the knowledge was retained during this period of time. These results corroborate those of another study[16] which obtained 54.7% agreement on the COPD-related knowledge of patients and health care professionals after an eight-week educational program; a group of authors[17] evaluated the level of knowledge of nurses on heart failure and found 70% agreement, however, they did not specify the elapsed time interval; and a study carried out in Brazil[6] on oral health knowledge in primary health care indicated a knowledge retention rate of 86.2% three months after the training provided. In our study population, the results support the retention of the knowledge acquired up to three months after the intervention, which indicates the importance of retaining knowledge about the condition through continuous education programs for multidisciplinary primary health care teams.

Primary health care usually focuses on meeting spontaneous demand, whereas preventive actions are capable of anticipating risks and even diagnosing diseases earlier. In this sense, guidance on prevention could provide users with a more integral care, which is a guiding principle of the Brazilian Unified Health System and in various other countries.[18]

Different training strategies have been implemented in an attempt to address the complexity of multidisciplinary primary health care teams.[19] We chose to use video lessons because it is a teaching tool that can be used in a distance learning setting, creating teaching/learning opportunities for health care professionals.[8,20]

The effect of the knowledge evolution of our study population can be identified by the increased rate of responses considered correct for each item after the training and by the change in the degree of agreement on the items investigated (from strong to very strong agreement). This effect was anticipated in a study[8] which considered video lessons a new and challenging resource capable of decentralizing knowledge and promoting the improvement of health competencies among individuals with different levels of knowledge, such as those of our study population. Thus, our study fills two gaps: the lack of studies investigating knowledge about COPD among primary health care

professionals and the possibility of training these professionals on COPD using a reproducible method.

The use of video lessons shortens geographic distances and promotes sustained knowledge in different communities. According to a group of authors,[21] the limited knowledge on COPD identified in interviews with health care professionals in South Africa, Japan, and Hong Kong indicates the need to improve knowledge, which can be accomplished through the use of video lessons.

Video-based continuing education is still an underused strategy for continuing training in health care in Brazil and it has the potential to expand multidisciplinary actions, integrating them into health care services. The literature[22] indicates a need to reflect upon and reformulate andragogical practices, as well as to focus on contents that have practical everyday applications for professionals. Video lessons are a teaching tool that meets such andragogical needs.[22]

The increase in the median score of participants seen immediately after our intervention and maintained three months thereafter shows the effectiveness of video-based training. Although the work of primary health care teams is quite complex, mainly educational in nature, their professional training is usually poor.[6] Therefore, the purpose of our intervention was to encourage interdisciplinarity and inform team members about COPD, one of the noncommunicable chronic diseases with high rates of morbidity and mortality worldwide, through the use of video lessons, an effective knowledge multiplier and driver of change.[6,23-25]

A multidisciplinary approach to education enables the patient-professional bond to be established and gives patients co-responsibility for their care, as they take on an active role in their health-related decision-making process.[26] When the team members are confident about their knowledge, the guidance provided and the communication actions implemented by them are enhanced and can minimize the conflicts between the community and the health care services.[19]

The present study showed us that video-based training can fill in the knowledge gaps of primary health care professionals. Our experience can also be used as a basis for planning future interventions.

The recommendation is that all members of the multidisciplinary primary health care team be trained.[19]

However, our study has limitations, such as the small number among the different professionals in the primary health care team and the absence of a control group. The small number of different professionals was due to the fact that we wanted to recruit a group of professionals from the same primary health care institution. As for the absence of a control group, we believe that our findings were due to the training provided, since the questionnaire was not made available to the participants and they had free access to the video lessons throughout the study period so that they could clarify any possible doubts.

The idea of using video lessons with different categories of health care professionals is justified by the characteristics of primary health care teams. Although physicians are clinically responsible for COPD patients, their goals would not be achieved without the support of the multidisciplinary team. In this context, we must recognize that all primary health care professionals benefit from professional training.[19]

Regarding the clinical benefit of the present study, we can highlight that training with video lessons can help the multidisciplinary primary health care team to identify possible COPD patients. This teaching model gives the team confidence to recognize COPD risk factors and symptoms, as well as the different types of pharmacological and nonpharmacological treatments available and the need for patient monitoring. Patients greatly benefit since they have access to the right information provided by the primary health care team.

Therefore, we can conclude that video-based training promoted the acquisition of knowledge about COPD by the members of a multidisciplinary primary health care team, who retained the knowledge for at least three months after the intervention. In future studies, it would be important to evaluate for how long the information is retained, which will determine whether or not the training should be repeated periodically.

REFERENCES

1. Menezes AM, Perez-Padilla R, Jardim JR, Muiño A, Lopez MV, Valdivia G, et al. Chronic obstructive pulmonary disease in five Latin American cities (the PLATINO study): a prevalence study. Lancet 2005;366(9500):1875-81. https://doi.org/10.1016/S0140-6736(05)67632-5

2. Rabahi MF, Pereira SA, Silva Júnior JL, de Rezende AP, Castro da Costa A, de Souza Corrêa K, et al. Prevalence of chronic obstructive pulmonary disease among patients with systemic arterial hypertension without respiratory symptoms. Int J Chron Obstruct Pulmon Dis. 2015;10:1525-9. https://doi.org/10.2147/COPD.S85588

3. de Queiroz MC, Moreira MA, Jardim JR, Barbosa MA, Minamisava R, Gondim Hdel C, et al. Knowledge about COPD among users of primary health care services. Int J Chron Obstruct Pulmon Dis. 2015;10:1-6. https://doi.org/10.2147/COPD.S71152

4. Sociedade Brasileira de Pneumologia e Tisiologia [homepage on the Internet]. Brasília: Sociedade Brasileira de Pneumologia e Tisiologia [updated 2012 Jun; cited 2018 Jun]. DPOC e Saúde Pública – Atendendo as necessidades dos pacientes. [Adobe Acrobat document, 17p.]. Available from: http://www.sbpt.org.br/downloads/arquivos/COM_DPOC/Relatorio_final_DPOC_Saude_Publica_2012_SBPT

5. Fracolli LA, Gomes MF, Nabão FR, Santos MS, Cappellini VK, de Almeida AC. Primary health care assessment tools: a literature review and metasynthesis. Cien Saude Colet. 2014;19(12):4851-60. https://doi.org/10.1590/1413-812320141912.00572014

6. Gouvêa GR, Silva MA, Pereira AC, Mialhe FL, Cortellazzi KL, Guerra LM. Evaluation of knowledge of Oral Health of Community Health Agents connected with the Family Health Strategy. Cien Saude Colet. 2015;20(4):1185-97. https://doi.org/10.1590/1413-81232015204.00682014

7. Starfield B. Atenção Primária: equilíbrio entre necessidades, serviços e tecnologia (online). Brasília/Brasil: UNESCO, Ministério da Saúde; 2002. p. 631-63. Available from: https://www.nescon.medicina.ufmg.br/biblioteca/imagem/0253.pdf

8. Arruda FT, Danek A, Abrão KC, Quilici AP. Preparation of educational videos for skills training for medical students in medical school. Rev Bras Educ Med. 2012;36(3):431-5. https://doi.org/10.1590/S0100-55022012000500019

9. Oliveira MH, Gonçalvez DU. Video lesson or teleconsulting for family doctors learning otorhinolaryngology. Rev Bras Educ Med. 2012;36(4):531-5. https://doi.org/10.1590/S0100-55022012000600012

10. Alcântara EC, Corrêa KS, Rabahi MF. Elaboration and validation of a questionnaire on the knowledge of Chronic Obstructive Pulmonary Disease among primary care professionals. Rev Educ Saude. 2017;5(2):6-18.

11. Cummings SR, Hulley SB. Designing questionnaires and interviews. In: Hulley SB, Cummings SR, Browner WS, Grady DG, Newman TB. Designing clinical research, 3rd ed. Philadelphia: Lippincott Williams & Wilkins, Wolters Kluwer Health; 2007. p. 241-55.

12. Bonin CD, Santos RZ, Ghisi GL, Vieira AM, Amboni R, Benetti M. Construction and validation of a questionnaire about heart failure patients' knowledge of their disease. Arq Bras Cardiol. 2014; 102(4):364-73. https://doi.org/10.5935/abc.20140032

13. Walker SL, Saltman DL, Colucci R, Martin L; Canadian Lung Association Advisory Committee. Awareness of risk factors among persons at risk for lung cancer, chronic obstructive pulmonary disease and sleep apnea: a Canadian population-based study. Can Respir J. 2010;17(6):287-94. https://doi.org/10.1155/2010/426563

14. Figueiredo VC, Szklo AS, Costa LC, Kuschnir MC, da Silva TL, Bloch KV, et al. ERICA: smoking prevalence in Brazilian adolescents. Rev Saude Publica. 2016;50 Suppl 1:12s. https://doi.org/10.1590/s01518-8787.2016050006741

15. Sayiner A, Alzaabi A, Obeidat NM, Nejjari C, Beji M, Uzaslan E, et al. Attitudes and beliefs about COPD: data from the BREATHE study. Respir Med. 2012;106 Suppl 2:S60-74. https://doi.org/10.1016/S0954-6111(12)70015-X

16. White R, Walker P, Roberts S, Kalisky S, White P. Bristol COPD knowledge questionnaire (BCKQ): testing what we teach patients about COPD. Chron Respir Dis. 2006;3(3):123-31. https://doi.org/10.1191/1479972306cd117oa

17. Machado CGD, Wansing GB, Klein C, Moraes MAP, Rabelo-Silva ER. Nurses' knowledge on heart failure in general hospital. Rev Enferm UFSM 2014;4(4):710-7. https://doi.org/10.5902/2179769211633

18. Mattos RA. Comprehensiveness in practice (or, on the practice of comprehensiveness) [Article in Portuguese]. Cad Saude Publica. 2004;20(5):1411-6. https://doi.org/10.1590/S0102-311X2004000500037

19. Kidd M. Educação e desenvolvimento profissional. In: Kidd M. A Contribuição da Medicina de Família e Comunidade para os Sistemas de Saúde: Um Guia da Organização Mundial dos Médicos de Família (WONCA). 2nd ed. Porto Alegre: Artmed; 2016. p. 73-150.

20. Costa CA, Petrucio WS, Rodrigues PMA, Lages RO, Wen CL. Effectiveness of practices for Web Conferencing Teleducation to combat dengue in the State of Amazonas, Brazil. J Health Inform. 2014;6(1):15-8. Available from: http://www.jhi-sbis.saude.ws/ojs-jhi/index.php/jhi-sbis/article/view/272/192

21. Aisanov Z, Bai C, Bauerle O, Colodenco FD, Feldman C, Hashimoto S, et al. Primary Care physician perceptions on the diagnosis and management of chronic obstructive pulmonary disease in diverse regions of the world. Int J Chron Obstruct Pulmon Dis. 2012;7:271-82. https://doi.org/10.2147/COPD.S28059

22. Knowles MS, Holton III, Elwood F, Swanson RA. Aprendizagem de resultados: uma abordagem prática para aumentar a efetividade da educação corporativa. Rio de Janeiro: Elsevier; 2009. p. 388.

23. Marin JM, Cote C, Casanova C, Pinto-Plata V, Montes de Oca M, Divo MJ, et al. Simplifying the guidelines: The 10 COPD commandments. Arch Bronconeumol. 2016;52(4):179-80. https://doi.org/10.1016/j.arbres.2016.01.012

24. Burton C, Pinnock H, McKinstry B. Changes in telemonitored physiological variables and symptoms prior to exacerbations of chronic obstructive pulmonary disease. J Telemed Telecare. 2015;21(1):29-36. https://doi.org/10.1177/1357633X14562733

25. Rocha GS, Lima MG, Moreira JL, Ribeiro KC, Ceccato Md, Carvalho Wda S, et al. Community health workers' knowledge on tuberculosis, control measures, and directly observed therapy [Article in Portuguese]. Cad Saude Publica. 2015;31(7):1483-96. https://doi.org/10.1590/0102-311X00112414

26. Carácio FCC, Conterno Lde O, Oliveira MA, de Oliveira AC, Marin MJ, Braccialli LA. The experience of a public institution in the training of health professionals to work in primary care [Article in Portuguese]. Cien Saude Colet. 2014;19(7):2133-42. https://doi.org/10.1590/1413-81232014197.08762013