

Caring for people at early and advanced COPD: How do family carers cope?

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Acknowledgements: The authors would like to acknowledge all institutions and carers involved, for their participation in this research.

Funding: This work was funded by Portuguese National Funds through FCT - Foundation for Science and Technology in the context of the project RIPD/CIF/109502/2009.

Conflict of interest statement: No conflict of interest has been declared by the authors.

ABSTRACT

Aims: To examine the coping strategies of family carers of people at early and advanced Chronic Obstructive Pulmonary Disease (COPD) and how those relate to their subjective health.

Background: Caring for a family member with COPD can be a stressful experience. Attention to coping is critical in understanding carer's outcomes. However, this topic has been narrowly addressed in the literature, particularly considering the caregiving experience at early COPD.

Design: A cross-sectional study with a convenience sample of family carers of people with COPD was conducted.

Methods: A structured questionnaire was used to collect data on socio-demographics and caregiving characteristics. Self-rated physical and mental health was measured by two items from the International Classification of Functioning, Disability and Health (ICF) checklist. Coping strategies were assessed with the Carers' Assessment of Managing Index (CAMI). Descriptive and inferential analyses were performed.

Results: A total of 158 family carers have participated: 109 caring for people at early and 49 at advanced COPD. Self-rated mental health and problem-solving, emotional-cognitive and managing stress coping were significantly different between groups. Significant correlations between self-rated physical health and problem-solving coping, and between self-rated mental health and emotion-cognitive and managing stress coping were found for carers at advanced COPD.

Conclusions: Family carers at early and advanced COPD cope differently with the caring demands. Nevertheless, problem-focused coping strategies were perceived as the most helpful by both groups. The study provided unique knowledge to the research literature on COPD as no previous study has compared family carers' coping strategies between COPD grades.

Relevance to clinical practice: The findings are relevant to inform early supportive interventions aiming to prevent burden and promote healthy adjustment to caregiving demands within the specific context of COPD.

Keywords: Chronic Obstructive Pulmonary Disease; Family carers; Coping.

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is currently a major public health concern (Pinto *et al.* 2007). As the disease progresses, family carers are central to provide support to these patients. Like many other chronic diseases, COPD has considerable impacts on mental health of family carers (Kara & Mirici 2004, Kühl *et al.* 2008) who have to deal with distressing symptoms of their loved ones and provide support with physical care and symptom control. However, the way family carers cope with the COPD caregiving demands remains unclear in the literature, particularly at early grades of the disease. Attention to coping is crucial to understand carers' outcomes, as coping strategies may be more important than the objective condition of the person with COPD in explaining the burden effects (Dupuis *et al.* 2004). The present study provides an important contribution to the research literature on COPD by focusing the use and perceived effectiveness of coping strategies of family carers of people at early and advanced grades of the disease.

BACKGROUND

Chronic Obstructive Pulmonary Disease is a major cause of mortality and disability (Mannino & Braman 2007, World Health Organization 2007) and by 2020, it is expected to be the third leading cause of mortality worldwide (Buist *et al.* 2007). According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD), COPD is a progressive condition that can be classified into four grades (GOLD 2011). At earlier grades (GOLD 1 and 2), the condition is mainly characterized by airflow limitation however, as the disease progresses (GOLD 3 and 4), exacerbations and comorbidities, and its psychological impacts (anxiety, depression, panic attacks) contribute to a high disability (Ek & Ternstedt 2008, GOLD 2011).

The gradual disability leads to an increasing dependence on significant others, frequently the patient's spouse/partner or other family member/friend (Simpson & Rocker 2008, Rodriguez Gonzalez-Moro *et al.* 2009). Family carers are, therefore, central to provide daily tasks and support for patients with COPD (Bergs 2002, Kanervisto *et al.* 2007, Caress *et al.* 2009). However, when compared to other chronic conditions, such as dementia, stroke or cancer, studies relying on the impacts of caring for a family member with COPD are relatively scarce. Nevertheless, there is growing evidence that caring for a family member at advanced grades of

COPD is a stressful experience, likely to involve significant burden (Bergs 2002, Simpson & Rocker 2008, Gardiner *et al.* 2009, Simpson *et al.* 2010) and is associated with poor quality of life (Pinto *et al.* 2007), high levels of loneliness feelings and anxiety/depression symptoms (Kara & Mirici 2004). The demands and responsibilities related to the caregiving role frequently result in social contacts restrictions, strain and lack of professional, financial and/or psychosocial support (Seamark *et al.* 2004, Currow *et al.* 2008, Caress *et al.* 2009).

Coping has been conceptualized by Folkman *et al.* (1986) as the specific behavioural and psychological efforts that people rely on to master, tolerate, reduce or minimize stressful events (such as caring for a dependent chronic ill family member). It is recognized for its significant impact on mental and physical health outcomes and for its potential for intervention (Folkman *et al.* 1986, Taylor & Stanton 2007). Nolan *et al.* (1995) have identified three main categories of coping strategies used by family or informal carers: problem-solving, emotional-cognitive and dealing with the consequences of stress (Nolan *et al.* 1995). *Problem-solving* or *managing events* involve direct action to alleviate caregiving stressful events. *Emotional-cognitive* or *managing meanings* involve efforts to change perceptions of a stressful event. *Dealing with the consequences of stress* occurs when an event can neither be dealt with directly nor re-evaluated. A number of studies have noted that problem-solving and emotional-cognitive coping have greater benefits for carers rather than dealing with the consequences of stress, and that carers tend to use a multiple set of strategies to deal with adversities (Jarvis *et al.* 2006, Salin *et al.* 2009, Barbosa *et al.* 2011).

Despite the different psychosocial demands that a chronic disease poses to patients and families throughout its course, information on how family carers cope with the caregiving role in the specific context of the COPD is scarce (Rolland 1994). According to our knowledge, studies comparing the use and efficacy of coping strategies among family carers between the different COPD grades have never been conducted.

Therefore, this study aimed to examine the coping strategies of family carers of people at early and advanced COPD and how those relate to their subjective health.

METHODS

Design and participants

A cross-sectional study was conducted with a convenience sample of family carers of people with COPD, between December 2010 and December 2011. Participants were included if they were: ≥ 18 years old; the primary carers of outpatients with COPD, i.e., the person who provided the largest amount of physical and/or supportive care to a person living with COPD in the community, without receiving any payment; able to understand the purpose of the study and agreed to voluntarily participate in the study. Participants were excluded if they presented severe psychiatric conditions and/or inability to understand and co-operate.

Family carers were recruited from two primary care centres and one district hospital in the central region of Portugal. Clinicians from these health organizations were asked to identify, according to the GOLD criteria, early (GOLD 1 and 2) and advanced (GOLD 3 and 4) outpatients with COPD (GOLD 2011). Potential eligible outpatients were contacted via telephone by a clinician's assistance, who informed about the study and asked their willingness to be contacted by the researchers. Interested participants received a telephone call from the researchers, were informed about the study specific objectives and were asked to identify eligible family carers. Family carers were next contacted by the researchers, informed about the study objectives and invited to participate. A meeting was then scheduled in the primary care centre or hospital, according to participants' location. A total of 210 family carers were identified, contacted and informed about the study. One hundred and eighty one agreed to participate, 29 refused as they did not perceive the study as relevant, and 23 failed the scheduled meeting. A final sample of 158 family carers was composed. Written informed consents were obtained prior to any data collection. Data on socio-demographics, subjective health and coping strategies were collected by interview-administrated questionnaires.

Data collection

Socio-demographic data and information on the caregiving situation (type of relationship with the cared-for person, caregiving period and hours of care provided per week) were collected through a structured questionnaire. Self-rated physical and mental health were measured by the two items from the International Classification of Functioning, Disability and Health (ICF) checklist (World Health Organization 2001): i) "How do you rate your physical health in the past month"; ii) "How do you rate your mental and emotional health in the past month?". Each item

has the following five reply alternatives in a Likert-type scale: “very good” (1); “good” (2); “moderate” (3); “bad” (4); “very bad” (5).

The Portuguese version of the Carers’ Assessment of Managing Index – CAMI (Brito 2002) was used to assess coping strategies. The original version of CAMI was developed by Nolan, Grant and Keady (Nolan *et al.* 1995). CAMI is a 38-item instrument comprising coping strategies into three domains: problem-solving (14 items); emotional-cognitive (13 items); and dealing with the consequences of stress (9 items). For each strategy/item, respondents indicate in a Likert-type scale if they: “do not apply” (0); “apply, but do not find helpful” (1); “apply and find it quite helpful” (2); or “apply and find it very helpful” (3). CAMI has presented high internal consistency with a Cronbach’s alpha coefficient (α) of .85 in the original version (Nolan *et al.* 1998) and of .80 in the Portuguese version (Brito 2002).

All instruments were administrated in a face-to-face interview conducted by two trained researchers (i.e., a physiotherapist and a gerontologist). The interviews lasted approximately 40 minutes. For the test-retest reliability study, a subsequent meeting with 10 participants was scheduled one week later from the baseline to perform a second measurement.

Ethical considerations

The study received full approval from the Ethics Committees of the Centre Health Regional Administration (Portugal) and of the São Sebastião Hospital (Portugal). The family carers who participated in this study were unpaid volunteers.

Data Analysis

Descriptive statistics were used to characterize the sample and to examine the frequency of responses in each CAMI statement, within each sub-scale (managing events/problem solving, managing meanings/perceptions and managing stress). Inferential statistics were used according to the fundamentals of parametric and non-parametric analysis (Hollingsworth *et al.* 1999) to compare family carers of people at early and advanced COPD. The frequency distributions of the CAMI were analyzed with Chi-square tests. Independent t-tests were used for the CAMI sub-scales scores. Self-rated physical and mental health were analyzed using

Mann-Whitney U-tests. Associations between CAMI and self-rated health were analyzed through Spearman's correlation coefficient.

Chronbach alpha coefficients were computed to assess the internal consistency of the items in total CAMI and in each sub-scale. Results were $\alpha=.947$ for total CAMI, $\alpha=.892$ for problem-solving, $\alpha=.899$ for emotional-cognitive, and $\alpha=.749$ for dealing with the consequences, indicating moderate to high internal consistency (George & Mallery 2003).

Test-retest reliability for self-rated physical and mental health and for the CAMI was performed using the Intra-Class Correlation Coefficient (ICC), equation (1,1), along with 95% confidence interval (CI)(Shrout & Fleiss 1979). The ICC values were .872 (95%CI=[.590-.966]) for self-rated physical health, .862 (95%CI=[.563-.963]) for self-rated mental health, .994 (95%CI=[.976-.998]) for total CAMI, .969 (95%CI=[.887-.992]) for problem-solving, .979 (95%CI=[.924-.995]) for emotional-cognitive, and .958 (95%CI=[.849-.989]) for dealing with the consequences. These values indicate an almost perfect test-retest reliability (Landis & Koch 1977).

A p-value < 0.05 was considered as statistically significant for all tests. All statistical analyses were performed using PAWS Statistics (Version 18.0, SPSS Inc., Chicago, IL).

RESULTS

Participants

Table 1 provides the socio-demographics and information on the caregiving situation of the carers. A total of 158 family carers were included in the study: 109 caring for people at early COPD, with a mean age of 58.39 (SD 12.65) years old, and 49 caring for people at advanced COPD, with a mean age of 60.84 (SD 13.04) years old. Family carers were mostly female, although statistically significant differences were found between groups: men, as carers, were more frequent at early rather than at advanced COPD grades ($p=0.020$). Most carers were married, had low educational qualifications and were retired or had a full time employment. Family carers were predominantly the spouse, caring for more than 4 years and several hours per week, particularly at advanced COPD ($p=0.002$). Perceived self-rated mental health was significantly worse in carers of people at advanced COPD than in carers of people at early COPD ($p=0.026$).

(Insert table 1 about here)

People with COPD were predominantly male (n=104; 65.8%), with a mean age of 69.04 (SD 11.61) years old (Table 2).

(Insert table 2 about here)

CAMI results

Table 3 presents differences in CAMI scores, per sub-scale. Family carers of people at advanced COPD relied significantly more on the three types of coping strategies than those caring for people at early COPD.

(Insert table 3 about here)

A more detailed comparative analysis of the most strategies used is presented next.

Problem solving strategies

Table 4 presents data on the use and helpfulness of problem-solving coping. Family carers of people at early COPD used less strategies involving direct action when compared to carers of advanced COPD. Nevertheless, “thinking about the problem”, “talking over the problem with someone I trust”, “getting as much help as possible from professionals” and “relying on my own expertise and experience” were the most useful coping mechanisms for both groups.

Carers of people at advanced COPD relied significantly more on strategies such as “establishing priorities and concentrating on them” (p=0.003) and “being firm and pointing out to the person I care for my expectations” (p=0.004), compared with carers of people at early COPD.

Emotional-cognitive strategies

Family carers of people at early COPD tended not to use this type of coping: more than 50% of these participants did not apply 10 of the 15 emotional-focused strategies (Table 4). Yet, “taking life one day at a time”, “realizing that there is always someone worse”, “accepting the situation as it is”, “drawing on strong personal and religious beliefs”, and “believing in oneself” were identified as the most used and helpful efforts in both groups.

Significant statistically differences were found for the following strategies: “greeting my teeth and just getting on with it” ($p=0.004$); “realizing that the cared-for person is not to blame for the way he/she is” ($p=0.020$); “looking for the positive things in each situation” ($p=0.015$); and realizing that no one is to blame for things ($p=0.011$). These coping methods were perceived as more effective by family carers of people at advanced COPD.

Dealing with the stress consequences

Dealing with the consequences of stress were the least used methods in both groups. However, statistically significant differences were found for “taking mind of things in some way (e.g., reading, watching television)” ($p=0.040$), and “maintaining interests outside caring” ($p=0.013$). These coping strategies were found to be more helpful for carers of people at advanced COPD.

(Insert table 4 about here)

Correlations between self-rated health and coping strategies

Statistically significant correlations between self-rated health and coping strategies were found only for carers of people at advanced COPD. Problem-solving coping strategies were associated to self-rated physical health ($r_s = -0.313$; $p=0.029$), i.e., an increase in problem-solving strategies was significantly associated with a better physical health perception. On the other hand, an increase in emotional-cognitive ($r_s=0.307$; $p=0.032$) and in dealing with the consequences ($r_s=0.382$; $p=0.007$) mechanisms were significantly associated with worse mental health perception.

DISCUSSION

Information on the coping strategies of family carers of people with COPD is largely invisible in the research literature. This study sought to compare the use and perceived effectiveness of coping strategies between family carers of early and advanced COPD. Significant statistically differences between groups were found, as family carers of people at advanced COPD tended to apply and find more useful the three types of coping. The results are not surprising since COPD is a progressive disease, which significantly affects patients' health-related quality of life and functionality (Simpson & Rocker 2008, Rodriguez Gonzalez-Moro *et al.* 2009), leading to an

increasing dependence on family carers, forcing them to adjust to their demanding caregiving role.

Despite the significant differences, problem-solving strategies were considered the most useful in both groups. These results are largely in line with those reported earlier on family carers of dependent older people (Nolan *et al.* 2002, Kuuppelomäki *et al.* 2004, Salin *et al.* 2009, Barbosa *et al.* 2011). “Thinking about the problem”, “getting help from professionals”, “talk with someone they trust” and “relying on their own expertise and experience” were the helpful efforts for both carers groups, supporting the idea that carers are proactive and determined. However, there is strong evidence that professionals systematically underestimate carers’ capacities and expertise (Nolan *et al.* 2003, Hanson *et al.* 2006). This is particularly relevant because if what works well for carers is not recognized, interventions targeted to support COPD carers may be inadequate and unsuccessful.

“Establishing priorities and concentrating on them”, and “being firm and pointed out the cared person own expectations” were significantly more used by carers of people at advanced COPD. This may be related with the fact that as the disease progresses, more complex and demanding support is required from family carers, such as dealing with complex technologies (e.g., home oxygen), multiple medication regime and treatments for symptom control (e.g., airway clearance techniques)(Caress *et al.* 2009). Moreover, advanced COPD highly affects patients’ emotional responses in terms of anxiety and depression symptoms, often requiring intensive emotional support from family (Hynninen *et al.* 2005). In this scenario, family carers need to organize themselves, by establishing priorities and pointing out to their loved ones their own expectations, to cope alongside with their other multiple social roles (Pearlin 1996).

Significant correlations between self-rated physical health and problem-solving coping in carers of people at advanced COPD were found, i.e., a better physical health perception is associated with an increasing use of problem-solving strategies. This result is lined up with the coping literature where there is relatively consensus that problem-focused efforts, targeted directly to manage stressful or problematic events, such a chronic illness, are regarded as adaptive (Livneh & Martz 2007) and associated to well-being (Dupuis *et al.* 2004, McNulty 2007).

Overall, emotional-cognitive coping was less used by family carers of people at early COPD. This might be explained by the fact that these carers were less involved in caregiving tasks, due to the grade of COPD and more focused at actively prevent the disease progress, by “finding relevant information”, “getting practical help” or “trying different solutions”. Nevertheless, “taking one day at a time”, “realizing that there is always someone worse”, “accepting the situation as it is”, “drawing on strong personal and religious beliefs”, and “believing in oneself” were the most useful strategies in both groups. These methods were largely the same as reported in previous studies (Nolan *et al.* 1996, Kuuppelomäki *et al.* 2004, Jarvis *et al.* 2006, Salin *et al.* 2009).

Efforts involving cognitive reframing, such as “realizing that no one is to blame” and “looking for the positive things” were significantly more applied by family carers of people at advanced COPD, who were also more engaged in caregiving tasks and probably more aware of the progressive and incapacitating nature of this chronic disease. Cognitive reframing is a mean of reconceptualising a problem, from something that is considered impossible to solve into something for which other coping strategies may be helpful (McNulty 2007). Positive reframing involves individual’s efforts to uncover the positive aspects of a situation, viewing it as an opportunity for further growth, and has been related to better adjustment within the context of chronic disease, namely multiple sclerosis (McNulty 2007). Thus, helping carers to develop this type of coping could be beneficial particularly under circumstances that are no longer suitable to be altered, like progressive chronic diseases such as COPD.

Nevertheless, significant correlations between self-rated mental health and emotional-cognitive coping in carers at advanced COPD were found: a poorer mental health perception is related to an increase in emotion-focused efforts. Carers of people at advanced COPD also reported significantly poorer subjective mental health. The findings are in line with previous research as carers experiencing high levels of distress use more often emotion-focused coping strategies (Rose *et al.* 1997). Such results suggest that the use of individual coping strategies in advanced grades of the disease might be limited, i.e., the use of personal coping strategies alone might not be enough to prevent burden and distress, especially when the caregiving period is longer and more demanding.

Similar to earlier studies (Kuuppelomäki *et al.* 2004, Salin *et al.* 2009, Barbosa *et al.* 2011), dealing with the consequences of stress were the least used coping mechanisms in both groups. Still, “taking mind of things in some way” and “maintaining interests outside caring” were significantly more helpful for carers of people at advanced COPD. This highlights the need of carers to take time for other interests apart from caring to prevent become overwhelmed.

Finally, significant correlations between self-rated mental health of carers of advanced COPD and managing stress coping were found. However, if we look at the use of each strategy it is quite clear that almost none is applied. For instance, unlike previous studies (Kuuppelomäki *et al.* 2004, Barbosa *et al.* 2011) the majority did not “keep some free time for him/herself” nor “attend a self-group”. Releasing oneself from caregiving obligations by taking some time off is a useful coping method not only to maintain mental health, but also to provide high-quality care for the patient during chronic stress periods (Okabayashi *et al.* 2008). Similarly, attending a self-group have been found to significantly reduce burden and led to a greater comprehension of how to cope with the caregiving role (Sörensen *et al.* 2002, McNulty 2007). Thus, raising community awareness on the availability of respite services is fundamental. Also, further interventions studies, based on the development of support-groups targeted to the specific context of COPD should be encouraged.

Limitations

Some limitations need to be acknowledged. A total of 158 COPD family carers participated in the study, however the sub-samples are **not equal** in terms of their size. Although the statistical analysis controlled the potential sample-size effects, studies with larger and more size-balanced comparative samples should be conducted in order to analyze the extent of these findings. Despite the comparison between family carers of people at early and advanced COPD, the cross-sectional design is limited to provide consistent data on how family carers cope with the caregiving demands along with the course of COPD. Future research needs to follow family carers of people with COPD over time and examine changes throughout the course of the disease. This information is crucial to plan adequate and successful interventions in the community to support COPD carers in their role and prevent burden during their caregiving trajectory.

CONCLUSIONS and RELEVANCE TO CLINICAL PRACTICE

Family carers cope differently with the caregiving demands at early and advanced COPD which might be explained by the gradual and incapacitating course of this chronic disease. Such knowledge is relevant to the planning of formal support interventions, which are more effective when available throughout the caregiving trajectory and targeted to the specific demands of each grade in the disease process (Hanson *et al.* 2006, McNulty 2007). Furthermore, the fact that carers of advanced COPD presented poorer subjective mental health suggest the limitations of individual coping strategies, and the need of adequate formal support. Thus, early interventions in COPD caregiving, including practical information about the disease and education on problem-solving coping and other alternative coping strategies (e.g., use of respite care, attend a psycho-educational group), seems to be crucial to prevent burden and to promote opportunities for carers to continue in their caregiving role without becoming ill themselves.

AUTHOR CONTRIBUTION

DF and AM were responsible for the study conception and design. RG and CJ performed the data collection. RG performed the data analysis. DF was responsible for the drafting of the manuscript. DF, RG, CJ and AM made critical revisions to the paper for important intellectual content. AM and DF obtained funding.

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Table 1 - Socio-demographic and caregiving characteristics of family carers (n=158).

Characteristics	Early COPD (n=109)	Advanced COPD (n=49)	p-value
Gender			
Female	77(70.6%)	43(87.8%)	0.020*
Male	32(29.4%)	6(12.2%)	
Age (years)	58.39±12.65 (26-80)	60.84±13.04 (21-81)	0.268
Academic qualifications			
No qualifications	12(11.0%)	7(14.3%)	0.121
1st cycle	38(34.9%)	25(51.0%)	
2nd cycle	20(18.3%)	5(10.2%)	
3rd cycle	13(11.9%)	7(14.3%)	
Secondary/Higher school	26(23.9%)	5(10.2%)	
Work status			
Full-time employment	33(30.3%)	14(28.6%)	0.994
Retirement	53(48.6%)	24(49.0%)	
Unemployment	11(10.1%)	6(12.2%)	
Domestic	10(9.2%)	4(8.2%)	
Marital Status			
Married	91(82.5%)	42(85.7%)	0.459
Single	9(8.3%)	4(8.2%)	
Divorced	6(5.5%)	2(4.1%)	
Widowed	4(3.7%)	1(2.0%)	
Relationship with person cared for			
Spouse	71(65.1%)	31(63.3%)	0.596
Daughter/son	29(26.6%)	12(24.5%)	
Brother/sister	1(0.9%)	2(4.1%)	
Others	8(7.3%)	4(8.2%)	
Caregiving period (years)			
Less than 1	12(11.0%)	4(8.2%)	0.403
1-2	11(10.1%)	3(6.1%)	
2-4	26(23.9%)	8(16.3%)	
More than 4	60(55.0%)	34(69.4%)	
Caregiving hours per week			
0-8h	50(45.9%)	13(26.5%)	0.002*
8-20h	24(22.0%)	16(32.7%)	
20-40h	28(25.7%)	8(16.3%)	
>40h	7(6.4%)	12(24.5%)	
Physical health	M3 IQR [2,3]	M3 IQR [2.5,3]	0.063
Mental an emotional health	M3 IQR [2,3]	M3 IQR [2,4]	0.026*

Notes: values shown mean±SD or n(%) unless otherwise indicated. Abbreviations: M, median; IQR, interquartile range [p25, p75]; *p≤0.05

Table 2 - Socio-demographic data of cared-for person (n=158).

Characteristics	Result
Gender	
Female	54(34.2%)
Male	104(65.8%)
Age (years)	69.04±11.61 (37-97)
GOLD classification	
GOLD 1	54(34.2%)
GOLD 2	55(34.8%)
GOLD 3	40(25.3%)
GOLD 4	9(5.7%)

Note: values shown mean±SD or n(%) unless otherwise indicated.

Table 3 – CAMI subscales scores in family carers of early and advanced COPD (n=158).

CAMI subscales	Early COPD (n=109) Mean ± SD	Advanced COPD (n=49) Mean ± SD	p-value
Problem-solving strategies	1.11 ± 0.72	1.43 ± 0.82	0.016*
Emotional-cognitive strategies	1.09 ± 0.73	1.42 ± 0.74	0.011*
Dealing with the stress consequences strategies	0.72 ± 0.63	0.94 ± 0.63	0.042*

Note: *p<0.05

Table 4 – CAMI strategies comparison by subscales (n=158).

Coping Strategies	Early COPD (n=109)			Advanced COPD (n=49)			p-value
	Use		Don't use	Use		Don't use	
	Helpful	Not really helpful		Helpful	Not really helpful		
Problem-solving strategies							
1. Establish a regular routine	38(34.9%)	3(2.8%)	68(62.4%)	24(49.0%)	2(4.1%)	23(46.9%)	0.069
3. Talk with someone you trust	67(61.5%)	3(2.8%)	39(35.8%)	33(67.3%)	2(4.1%)	14(28.6%)	0.375
5. Plan in advance	41(37.6%)	4(3.7%)	64(58.7%)	26(53.1%)	1(2.0%)	22(44.9%)	0.107
10. Find information about the problem	55(50.5%)	1(0.9%)	53(48.6%)	27(55.1%)	0	22(44.9%)	0.664
13. Get practical help from family	55(50.5%)	4(3.7%)	50(45.9%)	30(61.2%)	3(6.1%)	16(32.7%)	0.119
14. Keep person active	45(41.3%)	11(10.1%)	53(48.6%)	28(57.1%)	5(10.2%)	16(32.7%)	0.061
15. Alter home environment	36(33.0%)	4(3.7%)	69(63.3%)	24(49.0%)	1(2.0%)	24(49.0%)	0.091
17. Get help from professionals	58(53.2%)	9(8.3%)	42(38.5%)	32(65.3%)	2(4.1%)	15(30.6%)	0.338
18. Think about the problem	67(61.5%)	10(9.2%)	32(29.4%)	34(69.4%)	4(8.2%)	11(22.4%)	0.367
23. Prevent problems before they happen	53(48.6%)	4(3.7%)	52(47.7%)	30(61.2%)	2(4.1%)	17(34.7%)	0.127
29. Rely on experience and expertise	56(51.4%)	0	53(48.6%)	32(65.3%)	1(2.0%)	16(32.7%)	0.061
30. Try solutions until find one	56(51.4%)	4(3.7%)	49(45.0%)	25(51.0%)	4(8.2%)	20(40.8%)	0.628
31. Establish priorities	42(38.5%)	1(0.9%)	66(60.6%)	32(65.3%)	0	17(34.7%)	0.003*
33. Be firm and point what you expect	27(24.8%)	7(6.4%)	75(68.8%)	22(44.9%)	5(10.2%)	22(44.9%)	0.004*
Emotional-cognitive strategies							
6. See funny side of the situation	34(31.2%)	0	75(68.8%)	20(40.8%)	1(2.0%)	28(57.1%)	0.155
7. Realise there is someone worse	73(67.0%)	6(5.5%)	30(27.5%)	39(79.6%)	1(2.0%)	9(18.4%)	0.217
8. Grit teeth and get on with it	28(25.7%)	2(1.8%)	79(72.5%)	21(42.9%)	4(8.2%)	24(49.0%)	0.004*
9. Remember good times	44(40.4%)	1(0.9%)	64(58.7%)	27(55.1%)	0	22(44.9%)	0.107
11. Realise that person is not to blame	41(37.6%)	4(3.7%)	64(58.7%)	28(57.1%)	2(4.1%)	19(38.8%)	0.020*
12. Take life one day at a time	85(78.0%)	0	24(22.0%)	40(81.6%)	0	9(18.4%)	0.602
16. Realise that things are better now	37(33.9%)	2(1.8%)	70(64.2%)	18(36.7%)	2(4.1%)	29(59.2%)	0.545
20. Accept the situation as it is	66(60.6%)	7(6.4%)	36(33.0%)	36(73.5%)	4(8.2%)	9(18.4%)	0.059
22. Ignore the problem	20(18.3%)	7(6.4%)	82(75.2%)	16(32.7%)	3(6.1%)	30(61.2%)	0.073
24. Draw on personal or religious beliefs	64(58.7%)	2(1.8%)	43(39.4%)	36(73.5%)	1(2.0%)	12(24.5%)	0.068
25. Believe in yourself	65(59.6%)	0	44(40.4%)	35(71.4%)	2(4.1%)	12(24.5%)	0.054
26. Forget problems for a short while	47(43.1%)	3(2.8%)	59(54.1%)	24(49.0%)	5(10.2%)	20(40.8%)	0.122
27. Keep emotions under control	42(38.5%)	6(5.5%)	61(56.0%)	26(53.1%)	2(4.1%)	21(42.9%)	0.127
32. Look for the positives things	51(46.8%)	2(1.8%)	56(51.4%)	34(69.4%)	0	15(30.6%)	0.015*
34. Realise no one is to blame	39(35.8%)	6(5.5%)	64(58.7%)	26(53.1%)	5(10.2%)	18(36.7%)	0.011*
Dealing with the stress consequences strategies							
2. Let off steam	13(11.9%)	13(11.9%)	83(76.1%)	7(14.3%)	11(22.4%)	31(63.3%)	0.095
4. Keep some free time	53(48.6%)	2(1.8%)	54(49.5%)	22(44.9%)	1(2.0%)	26(53.1%)	0.682
19. Have a good cry	43(39.4%)	4(3.7%)	62(56.9%)	22(44.9%)	7(14.3%)	20(40.8%)	0.062
21. Take mind off things	44(40.4%)	8(7.3%)	57(52.3%)	27(55.1%)	5(10.2%)	17(34.7%)	0.040*
28. Try cheer up eating or similar	14(12.8%)	3(2.8%)	92(84.4%)	12(24.5%)	2(4.1%)	35(71.4%)	0.057
35. Get rid energy by walking or similar	29(26.6%)	1(0.9%)	79(72.5%)	18(36.7%)	1(2.0%)	30(61.2%)	0.157
36. Attend a self-help group	11(10.1%)	2(1.8%)	96(88.1%)	8(16.3%)	1(2.0%)	40(81.6%)	0.279
37. Use relaxation techniques	23(21.1%)	3(2.8%)	83(76.1%)	16(32.7%)	2(4.1%)	31(63.3%)	0.095
38. Maintain interests outside caring	46(42.2%)	2(1.8%)	61(56.0%)	30(61.2%)	2(4.1%)	17(34.7%)	0.013*

Notes: Chi-square tests were used to compare the two variables: "use" and "don't use"; *p≤0.05.