

TABLE 4. Correlations between dimensions of fatigue and QoL after the intervention (N=31)

		Symptoms	Function	Interpersonal	Well-being	Transcendent	Total QoL
Physical Fatigue	r	-.223	.461**	-.470**	-.615**	-.636**	-.543**
	P	.228	.009	.008	.000	.000	.002
Mental Fatigue	r	-.209	.013	-.285	-.313	-.322	-.436*
	P	.258	.944	.120	.087	.077	.014
Total Fatigue	r	-.248	.300	-.444*	-.550**	-.568**	-.567**
	P	.178	.101	.012	.001	.001	.001

* $p < 0,05$, ** $p < 0,01$

in the rehabilitation program, the results showed that there was a statistically significant difference in quality of life and specifically in the dimension of "Transcendent" ($p=0.013$) as well as the total score of MVQoL-15 ($p=0.046$). Patients with no fatigue presented better QoL.

DISCUSSION

The aim of this study was to compare the levels of fatigue and QoL (QoL) before and after the completion of a PRP in "Sotiria" public hospital. More specifically the focus of this research was to examine whether these two variables could be affected and/or improved by COPD patients who were attending a PRP. It was hypothesized that PRP seems to be a successful and innovative clinical prevention program leading to lower levels of fatigue and a better QoL for those patients who suffer from COPD.

In order to examine the aforementioned hypothesis, a paired sample t-test was performed. Results showed that compared to the initial measurement, fatigue dimensions such as physical, mental as well as total fatigue scores were decreased in the second measurement that took place after the completion of the PRP. Similarly, QoL dimension such as transcendence seemed to be improved in the second and final measurement compared to the initial one. Therefore, lower levels of physical, mental and total fatigue but also higher levels of transcendence seem to confirm the hypothesis of the current research.

Thus, hypothesis was validated as the results showed that there is a significant difference between the two measurements regarding the levels of fatigue and Transcendence. Most of the patients reported lower levels of fatigue and a better transcendence dimension regarding QoL after the completion of the PRP. This is not a surprising finding. According to the literature, fatigue is the effect of a complicated interplay among individuals' physical and

behavioral characteristics. Various physical situations may lead to fatigue, thus, when an efficient therapy is applied, fatigue levels seem to decrease.^{19,20}

On the other hand, transcendence that could be related to the sanctuary and is defined as "a search for meaning, at times of pressure"²¹ seems to be as an internal belief system or a way out of which COPD patients could gain strength and consolation. According to the literature, whether transcendence is framed by the values of humanity, nature, or religion it also contributes to the individuals' "ego" by providing them with strength and helping them to deal with increased anxiety.²²

According to a study²³ that was conducted, regarding the relation of transcendence and physical activity for COPD patients, it was indicated that the practice of transcendence contributes to a statistically significant physical health. Another significant correlation was found between social functioning and transcendence practice. Therefore, each individual acquires a transcendent and spiritual dimension. According to a study that was conducted by Kayahan²⁴ after the completion of a PRP, COPD patients who belonged to rehabilitation group seemed to show significant improvements in dyspnea, physical activity and their overall QoL compared to those patients who belonged to the control group.

Apart from the fact that the hypothesis was confirmed, another advantage of the current research is that this is the first time in Greece that a PRP uses these two instruments together in order to compare the possible differences in fatigue and QoL before and after the completion of the program.

Some limitations of this research include the following; the total sample of 31 participants which does not seem to be large enough may decrease the power of the research and raise at the same time the margin of error by leading to a possible meaningless study. Another limitation is as-

sociated to the fact that the female participants were less than male participants, and more specifically they were only the one third of the total number that took place in the research. This factor cannot provide very accurate results regarding gender differences.

Moreover, the program's limited time (3 months) could not guarantee an improved QoL with significant dimensions. In other words, a PRP that would last for more than three months could benefit the patients' QoL by probably showing significant results regarding interpersonal relationships, wellbeing, symptoms, and/or function dimensions. Finally, future research should be performed regarding fatigue and QoL in pulmonary rehabilitation for COPD patients in order to investigate whether there are differences before and after the PRP. For instance, a research could be focused on the differences between fatigue and QoL before and after a six month to one year PRP.

CONCLUSION

Therefore, PR is an extensive intervention based on a patient's meticulous assessment by providing exercise and education applied to each patient's needs and by aiming to an individual's behavioral change through a healthier lifestyle and a better QoL. PRP improves COPD patients' physical and psychological state by offering long-term attachment to health-promoting behaviors.⁴

The results of the current study may aid health care professionals, COPD patients and academic community to enrich their knowledge about PR strengths and opportunities regarding the Greek population. More specifically, health care professionals may strengthen and support COPD patients to follow a routine, join constantly and complete the PRP in order to gain the program's benefits by becoming more active and decrease their levels of fatigue. Since it seems to be the first time that the academic community may be benefited by such an innovative PRP that is applied in Greece, it seems that the program's advantages could cause the spread of other new, sufficient and more efficient Pulmonary Programs that will be ready to serve the Greek population in the future.

COPD patients should be helped by doctors and health care professionals by applying the principles of PRP and face patients through a multidimensional way with special regard to their QoL. There should be a cooperation

between professionals of the health care area and exploit every method towards this direction by taking seriously each patient's particular problems in order to achieve relief from the chronic disease's symptoms.

Furthermore, it seems to be essential to observe how the difference of fatigue and QoL levels could affect the results before and after the PRP measurement. Hence, future research should be conducted in order to develop strategies that they could diminish the fatigue in COPD patients and by improving at the same time their QoL. If, according to the literature, breath is related to the soul and mind is conceptually related to the soul,²⁵ then doctor and specialized scientists in lung diseases should perform further research to the transcendent needs of COPD patients.

ACKNOWLEDGEMENTS

The authors would like to acknowledge patients who participated in this study.

COMPLIANCE WITH ETHICAL STANDARDS

Conflict of Interest

The authors declare that they have no conflict of interest.

Funding statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical approval

Ethical approval was granted by the Scientific Council of General Hospital of Athens "Sotiria". All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

ΠΕΡΙΛΗΨΗ

Κόπωση και Ποιότητα Ζωής μετά από Πρόγραμμα Πνευμονικής Αποκατάστασης

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Εισαγωγή. Η κόπωση και η φτωχή ποιότητα ζωής μπορούν να διαδραματίσουν σημαντικό ρόλο στην χρόνια αποφρακτική ασθένεια και τα θεραπευτικά αποτελέσματα. Σκοπός αυτής της μελέτης ήταν η εξέταση των επιπέδων κόπωσης και ποιότητας της ζωής μεταξύ ασθενών με Χρόνια Αποφρακτική Πνευμονοπάθεια πριν και μετά από πρόγραμμα πνευμονικής αποκατάστασης. **Μέθοδος.** Σε αυτή την πειραματική μελέτη, 31 τυχαία επιλεγμένοι ασθενείς με Χρόνια Αποφρακτική Πνευμονοπάθεια προερχόμενοι από Τριτοβάθμιο νοσοκομείο της Αθήνας συμπλήρωσαν, πριν και μετά από πρόγραμμα πνευμονικής αποκατάστασης, δύο ερωτηματολόγια: Την κλίμακα *Fatigue Assessment Scale* για τη μελέτη των επιπέδων κόπωσης και την κλίμακα *Missoula-Vitas Quality of Life Index-15* για τη μελέτη της ποιότητας ζωής. Η στατιστική ανάλυση διεξήχθη μέσω του στατιστικού πακέτου *SPSS 19.0*. Το επίπεδο στατιστικής σημαντικότητας τέθηκε στο 0.05. **Αποτελέσματα:** Τα αποτελέσματα έδειξαν μειωμένα επίπεδα κόπωσης μετά την ολοκλήρωση του προγράμματος πνευμονικής αποκατάστασης σε σύγκριση με αυτά προ της παρέμβασης. Επιπλέον, αν και η ποιότητα ζωής δε φαίνεται να μεταβάλλεται μετά την παρέμβαση, η διάσταση «Πνευματικότητα» φαίνεται να αυξάνεται για την πλειονότητα των συμμετεχόντων. Μετά τη συμμετοχή στο πρόγραμμα αποκατάστασης παρατηρήθηκε στατιστικά σημαντική και αρνητική συσχέτιση μεταξύ της ψυχικής κόπωσης και της συνολικής βαθμολογίας της ποιότητας ζωής ($r = -0,436, p = 0,014 < 0,05$), καθώς και μεταξύ της σωματικής κόπωσης και των διαστάσεων της ποιότητας ζωής «Διαπροσωπικές Σχέσεις» ($r = -0,470, p = 0,008$), «Ευεξία» ($r = -0,615, p = 0,000$), «Πνευματικότητα» ($r = -0,636, p = 0,000$) και της συνολικής βαθμολογίας της ποιότητας ζωής ($r = -0,543, p = 0,002$). **Συμπεράσματα:** Ένα πρόγραμμα πνευμονικής αποκατάστασης φαίνεται να αποτελεί ένα επιτυχές και καινοτόμο πρόγραμμα πρόληψης που οδηγεί σε χαμηλότερα επίπεδα κόπωσης σε ασθενείς με Χρόνια Αποφρακτική Πνευμονοπάθεια.

Πνεύμων 2019, 32(3):72-80.

Λέξεις - Κλειδιά: Χρόνια Αποφρακτική Πνευμονοπάθεια, Κόπωση, Πρόγραμμα πνευμονικής αποκατάστασης, Ποιότητα ζωής

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