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Correlation between clinical and epidemiological characteristics of adolescents with idiopathic scoliosis and their quality of life: A pilot cross-sectional study

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***Abstract*---**Introduction: Adolescent idiopathic scoliosis (AIS) is characterized by abnormal lateral curvature of the spine during adolescence, resulting in physical deformities. Bracing and physiotherapy, are closely linked to heightened levels of psychological distress. Objective: The objective of this study is to investigate the relationship between the clinical and epidemiological characteristics of AIS patients and their quality of life. Subjects and Methods: This study encompassed 60 patients (52 females, 8 males), aged 13.85 ± 1.87 years, exhibiting mild to severe AIS (Cobb angle, 26.73 ± 8.65). All subjects adhered to a Schroth exercise program (SEP) for a minimum of three months, with 26 of them additionally undergoing conservative treatment with braces (22 Cheneau, 2 DDB, 1Gensingen). Each participant completed the ISYQOL questionnaire and an individual form detailing clinical and epidemiological characteristics. Statistical analyses were conducted using SPSS Statistics 21, with a significance level set at $P < 0.05$. Results: A notable correlation was observed concerning the use of braces (U 765.5, $P < 0.001$). Patients utilizing a brace demonstrated higher ISYQOL scores (Mean 13.69, SD 5.43), indicating a lower HRQoL compared to those exclusively following Schroth exercise programs (Mean 7.24, SD 4.01). Although not statistically significant, HRQoL exhibited positive correlations with the age at diagnosis ($r = 0.211$, $P = 0.106$), height ($r = 0.016$, $P = 0.903$), age at menstruation onset ($r = 0.070$, $P = 0.644$), and duration of Schroth exercise treatment ($r = 0.075$, $P = 0.568$). Conversely, HRQoL displayed negative correlations with age ($r = -0.005$, $P = 0.969$), weight ($r = -0.047$, $P = 0.723$), duration of brace treatment ($r = -0.041$, $P = 0.842$), maximum angle trunk rotation (ATR) ($r = -0.138$, $P = 0.889$), and maximum Cobb angle ($r = -0.138$, $P = 0.296$). The study indicated that lumbar curves were associated with a higher QoL, although the number of curves and body mass index (BMI) did not significantly affect QoL. Conclusions: The use of a brace was found to have a negative impact on HRQoL. Psychological support is crucial for adolescents with mild to severe scoliosis to enable their active participation in daily activities.

***Keywords*---**health-related quality of life, ISYQOL, adolescent idiopathic scoliosis, Schroth exercises, brace.

Introduction

Idiopathic Scoliosis (IS), as defined by the Scoliosis Research Society, represents a spinal deformity of unknown origin characterized by a curvature exceeding 10 degrees, encompassing the curvature of vertebrae. Prevalent in 2-3% of the juvenile population, IS constitutes approximately 80% of scoliosis cases (Korbel et al., 2014). When occurring in healthy adolescents aged 10-18, it is termed Adolescent Idiopathic Scoliosis (AIS). Previous research has indicated a substantial impact of scoliosis on Health-Related Quality of Life (HRQOL) among affected individuals. However, it is crucial to acknowledge that HRQOL in adolescents differs significantly from that of adults, owing to the pronounced

bodily changes during adolescence influenced by hormonal dynamics (Frisén, 2007). This transitional phase can lead to incongruence in body image perception, potentially affecting self-esteem and often triggering feelings of insecurity and inferiority (Saccomani et al., 1998). Notably, patients subjected to traditional bracing methods have exhibited emotions such as fear, denial, and anger, directed towards parents, healthcare providers, and even themselves (Sapountzi-Krepia et al., 2006). Consequently, adolescents afflicted with scoliosis encounter challenges in social integration, often resorting to activities that isolate them and, in many cases, fostering neurotic tendencies and predispositions to depression (Saccomani et al., 1998). Evidently, scoliosis constitutes a significant risk factor during adolescence, potentially resulting in profound psychosocial issues (Payne et al., 1997). Hence, it is imperative to extend support to these individuals, considering not only the physical dimension but also addressing psychological, social, and mental well-being.

While various studies have explored the Quality of Life (QOL) of adolescents with IS utilizing diverse assessment questionnaires, none have adequately measured HRQOL according to stipulated criteria. Additionally, no prior study has comprehensively integrated both clinical characteristics of scoliosis and epidemiological aspects of adolescent QOL. This existing research gap, coupled with the imperative to enhance the QOL of adolescents grappling with scoliosis, underscores the rationale for this study.

The present study aims to investigate the correlation between the clinical and epidemiological characteristics of adolescents with IS and their QOL, as assessed through responses to the Italian Spine Youth Quality of Life (ISYQOL) questionnaire. The ISYQOL questionnaire is tailored to adolescents undergoing conservative or surgical treatment for scoliosis or kyphosis (Caronni et al., 2017). Accordingly, a dual hypothesis has been formulated: The QOL of adolescents with mild or moderate IS is influenced by their clinical and epidemiological characteristics (sex, age, height, weight, BMI, family history of scoliosis, age at diagnosis, menstruation status, age of menarche, engagement in extra-curricular activities, Risser sign, angle trunk rotation, type of brace, duration of bracing treatment, duration of Schroth exercises, scoliosis type, and curvature) in a unique and individualized manner.

Materials and Methods

Participants

A total of 60 participants (52 females and 8 males) within the age range of 10-18 voluntarily participated in this pilot study. All participants received a diagnosis of mild or moderate idiopathic scoliosis, with spinal curvatures ranging from 10-45 degrees. They were actively engaged in a specialized physiotherapeutic program involving the Schroth method exercises. Of these, 26 adolescents underwent a conservative approach, utilizing a brace in combination with Schroth exercises, while 34 participants exclusively engaged in Schroth exercises. Comprehensive information regarding the study procedures was provided to the participants, and written informed consent was obtained to ensure their voluntary participation.

Individuals with non-idiopathic scoliosis, a history of spinal surgery, or any other spine-related conditions were excluded from the study.

Convenience sampling was employed, wherein participants were selected based on their attendance at the physiotherapeutic clinic during the study period. This study was conducted at two distinct clinical settings: the specialized Schroth Scoliosis and Spine Clinic in Athens and the private physiotherapeutic practice, Ergastiri Kinisis, in Katerini. The data collection period for this study extended from 1st October 2020 to 31st January 2021.

Materials and Methods

This cross-sectional study employed the Italian Spine Youth Quality of Life (ISYQOL) questionnaire to assess the impact of scoliosis on the quality of life (QOL) of adolescents. The ISYQOL questionnaire, developed using Rasch analysis, represents the inaugural Health-Related Quality of Life (HRQOL) instrument meticulously tailored for adolescents contending with spinal deformities. Its design enables direct comparisons and precise measurements of HRQOL among patients with and without a brace, as well as before and after brace recommendation (Caronni et al., 2017). Comprising 20 questions, each scored as 0, 1, or 2, the ISYQOL questionnaire culminates in a score that is converted to a time-based measurement on a scale from 0 to 100%. Higher scores on this scale signify an improved QOL. Specifically, seven questions are dedicated to gauging the impact of wearing a brace and are exclusively answered by individuals utilizing one. Through Rasch analysis, a comparative assessment of ISYQOL scores is facilitated between those wearing a brace (answering all 20 questions) and those without a brace (answering 13 questions) (Caronni et al., 2019). The responses to certain questions in the questionnaire are scored differently. The final questionnaire score is used to calculate the percentage of QOL, with a higher percentage indicative of an enhanced QOL. The standard deviation is also computed based on the final questionnaire score. In addition to completing the ISYQOL questionnaire, adolescents provided personal information and details regarding their scoliosis, which were meticulously recorded by the attending physiotherapist (Caronni et al., 2017).

Procedures

To ensure eligibility for participation in this study, each participant was required to complete a Schroth exercise program (SEP) and consistently wear a brace for a minimum duration of 12 weeks prior to responding to the Italian Spine Youth Quality of Life (ISYQOL) questionnaire. The research team selected this 12-week duration as a baseline to standardize exposure levels to both the "exercise" and "brace" factors among all participants. This strategic standardization aimed to enhance homogeneity across the participant group, enabling accurate measurement of the impacts of these factors on their Health-Related Quality of Life (HRQoL).

The physical therapists at each clinic initially provided participants with comprehensive briefings regarding the study requirements and protocols. Subsequently, informative meetings conducted by the research team

disseminated detailed study information to participants. During these sessions, participants were furnished with printed informational materials and were given the opportunity to express their interest in voluntarily participating in the study. The study design and procedures were thoroughly explained during these meetings, ensuring that participants could make an informed decision about their involvement.

This study was conducted in adherence to the highest ethical standards. Ethical approval for the study protocol was obtained from the Ethics Committee of the International Hellenic University (Approval No. 48/11-04-2022). Furthermore, written informed consent was diligently obtained from the legal representatives of all participants, reaffirming their voluntary participation in the study and establishing compliance with stringent ethical guidelines.

Participants

A total of 60 participants were involved in this study, with 13.3% being boys and 86.7% girls. The majority of participants (65%) resided in Athens, while the remainder were distributed across Katerini (7%), Peiraius (6.7%), and Chalkida (5%). Detailed participant characteristics, including average height, weight, Body Mass Index (BMI), age of menstruation onset, age of diagnosis, Risser sign, maximum Angle Trunk Rotation (ATR), total score, ISYQOL percentage, and highest Cobb angle, are summarized in Table 1. Notably, 41.7% of the children had a family history of scoliosis, and a significant majority (78.3%) participated in extracurricular activities. The specific types of curvature and hump observed in the participants are presented in Tables 2 and 3, respectively.

In terms of treatment strategies, 56.7% of participants engaged in exercises, while 43.3% performed exercises in combination with wearing a brace. More specifically, 84.6% utilized a "Cheneau" brace, 11.5% a "DBD" brace, and 3.8% a "Gensingen" brace. In the context of Schroth exercise treatment, the average duration was 11.62 ± 11.22 months, whereas the average bracing period was 20.69 ± 17.05 months, with an average daily wear time of 17.33 ± 3.11 hours (Table 1). Regarding the Risser sign, 23.3% were classified as Risser 0, 8.3% as Risser 1, 16.7% as Risser 2, 15% as Risser 3, 20% as Risser 4, and 16.7% as Risser 5.

Table1: Descriptive Statistics

	N	Mean	SD	Minimum	Maximum
Age	60	14.43	1.77	10.00	18.00
Height	60	159.98	8.74	140.00	188.00
Weight	60	49.26	7.05	33.00	64.00
BMI	60	19.17	2.05	14.00	24.00
Age of menstruation beginning	46	11.80	1.03	9.00	14.00
Age of diagnose	60	11.40	2.24	6.00	16.00
RisserSign	60	2.50	1.81	0.00	5.00
Months of Treatment with Schroth exercises	60	11.62	11.22	1.00	47.00
Months of Treatment with Brace	26	20.69	17.05	1.00	64.00
Hours wearing the Brace per day	26	17.33	3.11	9.00	23.00
Maximum ATR	60	8.43	2.77	3.00	14.00

	N	Mean	SD	Minimum	Maximum
Total ISYQOL Score	60	10.03	5.65	1.00	31.00
Scoring Percentage ISYQOL	60	60.04	9.80	35.00	88.00
Highest CobbAngle	60	26.71	8.63	11.00	40.00

Table 2: Curve Interpretation

	Frequency	Percent	Valid Percent	Cumulative Percent
Double thoracic and lumbar scoliosis	5	8.3	8.3	8.3
Thoracic and lumbar scoliosis	32	53.3	53.3	61.7
Thoracic scoliosis	6	10.0	10.0	71.7
Thoracolumbar scoliosis	7	11.7	11.7	83.3
Lumbar scoliosis	5	8.3	8.3	91.7
Thoracic and thoracolumbar scoliosis	5	8.3	8.3	100.0
Total	60	100.0	100.0	

Table 3: ATR Interpretation

	Frequency	Percent	Valid Percent	Cumulative Percent
Thoracic and lumbar hump	32	53.3	53.3	53.3
Thoracic and thoracolumbar hum	10	16.7	16.7	70.0
Lumbar hump	3	5.0	5.0	75.0
Thoracolumbar hump	11	18.3	18.3	93.3
Thoracic hump	4	6.7	6.7	100.0
Total	60	100.0	100.0	

Statistical Analysis

The responses from the ISYQOL questionnaire and the personal details and scoliosis characteristics forms were systematically coded and subjected to statistical analysis using SPSS Statistics package, version 21. Quality variables were analyzed using statistical tables presenting frequency and relative frequency, as well as visual representations such as bar charts and pie charts to effectively portray the results. Quantity variables were analyzed using histograms illustrating frequency and relative frequency, along with measures of position and dispersion (e.g., mean, median, standard deviation, maximum, and minimum values).

To investigate correlations between the final ISYQOL questionnaire scores and other variables provided in the participants' personal details, appropriate correlation techniques were applied, including the Spearman correlation coefficient, Exact Fisher test, non-parametric Mann-Whitney test, and Kruskal-Wallis test. The significance level was set at 5%. Given that the subgroups created

based on the levels of the factors did not adhere to the assumption of normality necessary for the use of the t-test to assess mean equality, a non-parametric Mann-Whitney median equality test was utilized.

Results

In the exploration of correlations between the final ISYQOL questionnaire scores and participant personal details, a significance level of 5% was employed. Since the subgroups based on the levels of the tested factors did not meet the assumption of normality required for the t-test (average rate equality test), the non-parametric Mann-Whitney median equality test was applied (Table 4). Table 5 presents the mean, standard deviation (SD), median, and relevant observations for each factor studied at different levels.

Significantly, there was a notable difference observed concerning the use of a brace (U765.5, p-value < 0.001, Table 4), and consequently, the treatment approach pursued (U765.5, p-value < 0.001, Table 4). Specifically, children utilizing a brace exhibited higher ISYQOL scores compared to those who did not, indicating a lower quality of life for children undergoing Schroth exercise treatment (Table 4 and 5).

Table 4: Mann-WhitneyTest

Total Score ISYQOL	Test Statistic (U)	P-value	Total N
Sex	188	0.66	60
Family Record on Scoliosis	320	0.08	60
Extra-curricular Activities	235	0.21	60
Menstruation	164	0.86	52
Brace	***765.5***	***<0.001***	***60***
Treatment during study	***765.5***	***<0.001***	***60***
BMI Category	*446.5*	*0.75*	*60*
Scoliosis	*537*	*0.16*	*60*

Table 5: Descriptive Statistics

ISYQOL Total Score		N	Mean	SD	Median
Sex	*Female*	52	9.73	5.15	8.50
	Male	8	12.00	8.38	9.50
Family Record on Scoliosis	*Yes*	25	8.92	6.27	7.00
	No	35	10.83	5.10	9.00
Extra-curricular Activities	*Yes*	47	9.32	4.71	8.00
	No	13	12.62	7.90	12.00
Menstruation	*Yes*	45	9.84	5.28	13.50
	No	7	9.00	4.51	8.00
Brace	*Yes*	*26*	*13.69*	*5.43*	*13.00*
	No	*34*	*7.24*	*4.01*	*7.00*

ISYQOL Total Score		N	Mean	SD	Median
Treatment during Study	*Exercises*	*34*	*7.24*	*4.01*	*7.00*
	Exercises and Brace	*26*	*13.69*	*5.43*	*13.00*
Type of Brace	*Cheneau*	22	13.54	13.00	13.50
	DDB	3	16.00	4.19	9.00
	Gensingen	1	10.00	5.43	10.00
Sign Risser	*0*	14	9.93	4.87	10.5
	1	5	12.80	5.45	15.00
	2	10	8.20	3.01	8.50
	3	9	7.89	3.14	7.00
	4	12	13.17	8.58	11.00
	5	10	8.80	5.14	7.50
BMI Range	*Normal*	37	9.92	5.05	9
	Thinness	23	10.21	6.61	8
Scoliosis	*Mild*	26	8.77	4.57	8
	Normal	34	11.00	6.24	10

Statistical Analysis of ISYQOL Scoring

To assess potential differences in ISYQOL scoring based on the "Risser sign" and the type of brace utilized, a non-parametric Kruskal-Wallis statistical test was applied. The analysis indicated that ISYQOL scores did not exhibit statistically significant differences concerning either the type of brace used (Test statistic 0.83, p-value 0.66, Table 6) or the Risser sign rate (Test statistic 4.87, p-value 0.43, Table 6).

Table 7 illustrates the correlation between ISYQOL scoring percentage and various factors including the months of treatment with Schroth exercises, age, height, weight, age of menstruation onset, age of diagnosis, months of treatment with a brace, daily bracing hours, maximum ATR, and the highest Cobb angle. While no statistically significant correlations were observed at the 5% significance level, certain trends were identified. The quality of life appeared to exhibit a positive correlation with age of diagnosis, height, months of treatment with Schroth exercises, and age of menstruation onset. Conversely, a non-statistically significant negative correlation was noted with age, weight, months of treatment with a brace, and maximum ATR; as age, weight, months of brace treatment, and maximum ATR increased, the quality of life tended to decrease. Additionally, a non-statistically significant negative correlation was observed between the scoring percentage and the highest Cobb angle, suggesting that a higher scoliosis curvature leads to a lower quality of life (Table 7).

Table 6: Kruskal-Wallis Test

ISYQOL Total Score	Test Statistic	P-value	Total N
Type of Brace	0.83	0.66	26
Risser Sign	4.87	0.43	60

Table 7: Correlations (Spearman)

Score Percentage and …	Correlation	P-value
Months of Treatment with Schroth exercises	0.075	0.568
Age	-0.005	0.969
Height	0.016	0.903
Weight	-0.047	0.723
Age of Menstruation Beginning	0.070	0.644
Age of Diagnose	0.211	0.106
Months of Treatment with Brace	-0.041	0.842
Maximum ATR	-0.018	0.889
Maximum Cobb curve	-0.138	0.296

Quality of Life Levels and Correlations

In this study, the quality of life was categorized into four levels based on the ISYQOL score percentages:
0-25%: Low quality of life
26-50%: Normal quality of life
51-75%: Good quality of life
76-100%: High quality of life

Results showed that 11.7% of the children experienced a normal quality of life, 85% had a good quality of life, and 3.3% reported a high quality of life. Remarkably, a total of 88.3% of the children led a good or high quality of life, and none fell into the low quality of life category. Additionally, 43.3% of the participants had mild scoliosis (Cobb angle 10-25°), while 56.7% had moderate scoliosis (Cobb angle 25-40°).

In terms of correlations between quality of life and different curvature types, it was evident that adolescents with a "lumbar" curve had the highest quality of life, followed by those with "thoracolumbar" and "thoracic" curves. Adolescents with "double thoracic and lumbar" and "thoracic and lumbar" curves had slightly lower quality of life, and those with a "thoracic" curve exhibited the lowest quality of life. However, the number of curves did not significantly affect the overall quality of life (Chart 1). Similarly, adolescents with double humps ("lumbar and thoracic" or "thoracic and thoracolumbar") reported a lower quality of life compared to those with a single hump (lumbar, thoracic, or thoracolumbar). Notably, adolescents with a single lumbar hump had the best quality of life (Chart 2).

Lastly, analyzing correlations between questions on the ISYQOL scale using Fisher-exact test, a significant statistical relationship was found between the concern that the back problem might worsen and the concern that it would cause inconvenience in adulthood. Although not statistically significant, correlations were observed between the concern that their condition might worsen and the feeling of enduring a challenging period, as well as the concern that, despite their efforts, their condition might not improve (Table 8).

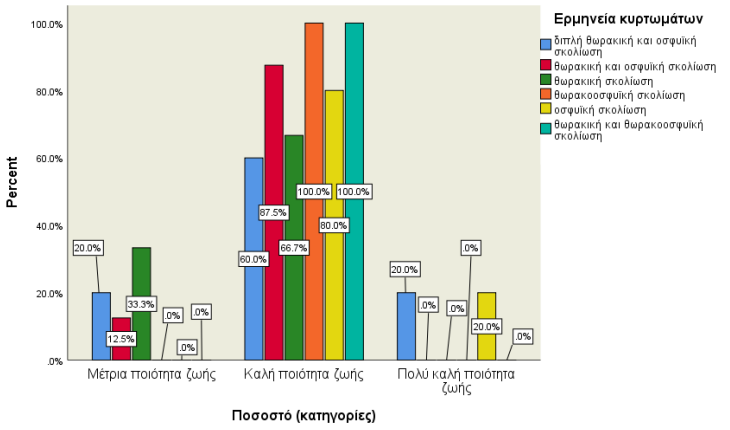

Chart 1: Group ped bar chart of relative frequency of quality of life with curvatures

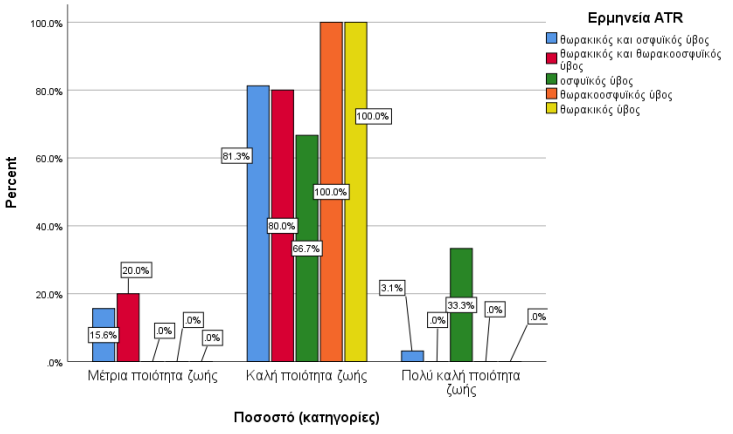

Chart 2: Group ped bar chart of relative frequency of quality of life with ATR

Table 8: Correlation with Fisher test

	Are you concerned that your back problem will get worse?	
	Fisher-exact test	p-value
Are you concerned that it will cause inconveniences throughout your adult life?	17,66	**<0,001**
Doyoufeelthatyourstateis "veryhard"?	7,42	0,085
Areyouconcernedthatyourstatewillnotimprovedespitetheeffort?	12,92	0,005

Discussion

This study sought to understand the correlation between various clinical and epidemiological characteristics of adolescents with idiopathic scoliosis and their quality of life, as assessed by the ISYQOL questionnaire. Comparisons with previous studies reveal differing conclusions on the relationships between these factors and the quality of life of adolescents with scoliosis.

In previous studies, differences were observed between boys and girls regarding their quality of life. Diarbarkeli et al. (2019) found that boys had higher SRS-22 scores but lower EQ-5D rates, ultimately resulting in a similar total quality of life score. Aulisa et al. (2010) and Ugwonali et al. (2004) noted that boys with braces had a better quality of life than girls. The type and location of the curvature were also explored. Aulisa et al. (2010) suggested that thoracolumbar curves were associated with a better quality of life. Recent studies by Hernandez et al. (2018) and Soliman et al. (2018) indicated that higher scoliosis (higher Cobb angle) was associated with lower quality of life. Wang et al. (2014) found a negative association between body image and Cobb angle, curve deviation from the vertical axis, and hump size.

However, our study observed different trends. We found no significant divergence in ISYQOL scores based on sex. Children with mild scoliosis (10 to 25°) had a slightly lower score, suggesting a better quality of life compared to those with moderate scoliosis (25 to 40°). There was a negative correlation, albeit not statistically significant, between ISYQOL score percentage and Cobb angle, as well as the size of the hump (ATR), indicating that a higher curve and a larger hump size were associated with a lower quality of life.

Regarding bracing, our study showed a significant difference in ISYQOL scores between those using a brace and those not using one, contrary to some previous studies. The type of brace also appeared to affect the quality of life, with children wearing a Gensingen type brace having a higher ISYQOL score, indicating a better quality of life.

In line with the study by Han et al. (2015), we found that quality of life is influenced by various factors including scoliosis family history, participation in extracurricular activities, BMI, age, height, weight, months of treatment with Schroth exercises, months of brace treatment, and age of diagnosis. Children with a family history of scoliosis and those engaging in extracurricular activities tended to have a better quality of life. Additionally, higher age of diagnosis, greater height, and longer treatment with Schroth exercises were correlated with a better quality of life.

Overall, this study sheds light on the complex relationships between scoliosis, treatment methods, and various demographic and clinical factors that impact the quality of life of adolescents. The findings emphasize the importance of individualized treatment approaches tailored to specific patient characteristics to enhance their quality of life. Further research is warranted to deepen our understanding and guide effective interventions for this population.

In this study, we delved into the relationships between the anatomical characteristics of scoliosis, particularly humps and curves, and the quality of life (QOL) of adolescents. The analysis categorized humps into various types and explored their impact on QOL. We also examined different curve groups and their association with QOL.

Our findings indicate that adolescents with a double hump, specifically a combination of thoracic and lumbar humps, tend to have a lower quality of life compared to those with a single hump (thoracic, lumbar, or thoracolumbar). Notably, adolescents with a single lumbar hump exhibited the highest quality of life. This observation suggests that the presence and location of humps are significant factors in determining QOL in individuals with scoliosis.

Similarly, we categorized scoliotic curves into distinct groups, such as lumbar, thoracolumbar, thoracic, and combinations of these. It was observed that adolescents with a lumbar curve tended to have a higher quality of life, followed by those with thoracolumbar and thoracic curves. On the other hand, individuals with thoracic curves exhibited the lowest quality of life. Interestingly, the number of curves did not appear to influence the overall quality of life, emphasizing that the specific type and location of the curve play a more critical role.

Despite the lack of statistical significance in the overall study, our results underscore the importance of individualized assessments for each participant. The diverse effects of various clinical and epidemiological characteristics on the QOL of adolescents with idiopathic scoliosis were observed, reinforcing the need for tailored approaches in treatment and care.

Moreover, we explored correlations between specific questions in the ISYQOL scale using the Fisher-exact test. Our findings suggest a significant association between concerns about the worsening of back problems and the anticipation of inconvenience throughout adulthood. Additionally, although not statistically significant, correlations were noted between the fear of deterioration and the perception of a challenging situation, as well as concerns regarding improvement.
In conclusion, this study highlights the intricate relationship between anatomical characteristics of scoliosis, specifically humps and curves, and the QOL of adolescents. It underscores the necessity for personalized approaches considering the unique interplay of clinical and epidemiological factors in determining the QOL of each individual. Further research is warranted to deepen our understanding and aid in the development of targeted interventions to improve the lives of adolescents with scoliosis.

Limitations

While this study has provided valuable insights, there are several limitations that should be acknowledged for a comprehensive interpretation of the findings. First, the uneven distribution of specific characteristics within the sample and the relatively small sample size contributed to the non-statistical significance of many results. A larger, more homogeneous sample could potentially yield more robust and statistically significant outcomes. Additionally, the fact that the sample was drawn from only two centers in Greece may have limited the diversity of the

sample due to potential demographic restrictions. Future research should aim for a more diverse and representative sample through stratified sampling to allow for broader generalizability of the statistical results to the entire population of Greece.

Conclusion

In conclusion, this study establishes a significant correlation between the clinical and epidemiological characteristics of adolescents with idiopathic scoliosis and their quality of life (QOL). The findings emphasize the adverse impact of bracing, the duration of brace treatment, and brace type on the QOL of adolescents. Several factors were identified to influence QOL, including sex, family history of scoliosis, participation in extracurricular activities, type of hump, and type of scoliotic curve. Notably, adolescents with lumbar hump and lumbar scoliosis exhibited the highest QOL. Furthermore, negative correlations were observed between QOL and age, weight, hump size (ATR), and scoliosis degree (Cobb angle), while positive correlations were noted with height and the duration of Schroth exercise treatment. Interestingly, BMI and the number of curves did not demonstrate a significant impact on QOL.

Based on these findings, it is imperative for clinical physiotherapists treating adolescents with idiopathic scoliosis to consider and address factors that negatively impact their patients' QOL. A targeted and prompt physiotherapeutic intervention is essential, addressing both physical limitations and mental well-being. The use of appropriate QOL assessment tools, such as ISYQOL, is crucial for accurate evaluation and timely provision of psychological support when needed.

Enhancing the quality of life for patients necessitates careful attention to their mental health, particularly for adolescents wearing a brace and experiencing other factors that adversely affect their QOL. This holistic approach, combining physical therapy and psychological support, is fundamental for a comprehensive improvement in the overall well-being of these individuals.

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Conflicts of Interest:
The authors declare no conflict of interest.

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