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Quality of life and well-being in university students with intellectual disabilities

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ABSTRACT

This study examined the impact of an intervention applied through the module 'emotional competencies and personal development', aimed at university students with intellectual disabilities and autism, with the goal of improving their well-being and self-perceived quality of life. To this end, the INICO-FEAPS scale was used, designed for the multidimensional assessment of quality of life in people with intellectual disabilities. The results showed an improvement in perceived quality of life after the intervention, regardless of the degree of disability, the presence of autism, age or gender. This shows that individualized interventions focused on personal development can promote the well-being of participants, highlighting the importance of programs that strengthen socio-emotional skills and pre-employment preparation. A quasi-experimental design of repeated measures without a control group was used with 14 participants. Pre-post differences were analyzed using the Wilcoxon signed-rank test, estimating effect sizes. Significant improvements were observed in social inclusion, interpersonal relationships, and physical well-being, with high-magnitude effects on overall quality of life indices. Although the findings are preliminary, they provide evidence on the feasibility and potential impact of social-emotional interventions in understudied university contexts.

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1. INTRODUCTION

In recent years, the concept of quality of life has been defined within a consistent model composed of eight dimensions. This model refers to the individual's pursuit of three main aspects: independence, social participation, and well-being [1]. According to Schalock and Verdugo [2], the study of quality of life can be divided into eight core dimensions: i) emotional well-being focuses on feelings of calmness and security, as well as the reduction of negative emotions and perceived stress or anxiety; ii) interpersonal relationships: refer to the quality of relationships with others, including friendships, family members, peers, and partners; iii) material well-being relates to economic security and satisfaction with material living conditions; iv) personal development focuses on learning capacity, skill development, and personal fulfilment; v) physical well-being refers to physical health, energy levels, and the ability to carry out daily activities; vi) self-determination concerns control over one's own life and the ability to make decisions regarding personal life, leisure time, employment, place of residence, and the people with whom time and activities are shared; vii) social inclusion focuses on the sense of belonging to a community and participation in society; and viii) rights refer to respect for human rights and equality of opportunities.

Among all the dimensions, emotional well-being constitutes a key aspect of quality of life for all individuals, as it directly influences mental health, the ability to relate to others, and performance across various areas [3]. In the case of students with intellectual disabilities or autism spectrum disorder, this component becomes even more significant. These students often face additional challenges that may affect their emotional, social, and academic development. Therefore, it is crucial to understand the emotional needs of this group and to promote strategies that support their overall well-being in order to facilitate their successful transition into employment. This includes providing appropriate emotional support, fostering social inclusion, adapting teaching methods to their learning needs, and ensuring that they feel valued and actively involved in the educational process within the university context.

Students with intellectual disabilities often face various challenges in these areas, which may negatively affect their emotional well-being and, consequently, their academic and social development [4]. This highlights the importance of offering the necessary support to enhance these skills, thereby promoting inclusion and participation. For this reason, within the educational context, the ability to establish and maintain relationships with peers becomes particularly relevant, as it helps to create affective environments in which the ways students experience and reframe their emotional experiences are shaped [5].

It is important to emphasize that emotional education emerges as a key tool for improving the emotional skills of students with intellectual disabilities, promoting their autonomy and enhancing their social participation [6]. The implementation of emotional education programs for young people with intellectual disabilities can lead to significant improvements in both social adjustment and academic performance [7]. These programs provide students with the necessary tools to relate more effectively to their peers, to cope with emotional challenges, and to maximize their academic potential. Dias *et al.* [5] offer a reasoned critique of the role played by the environment in relation to needs and appropriate socio-emotional development. The environment can either promote socio-emotional learning or hinder it. Furthermore, they point out that school contexts generally tend to hinder social-emotional learning by denying or minimizing problems and thus reducing the possibility of discussing them. This is completely contrary to positive development from the socio-emotional well-being paradigm [6], [8].

To promote the emotional well-being of students with intellectual disabilities, it is essential to implement strategies tailored to their specific needs. These strategies may include social skills development programs, stress management techniques, and activities designed to strengthen self-esteem. Social skills programs, for example, can help students improve their interactions with others, while stress management techniques provide tools to cope with emotionally challenging situations. In addition, activities that foster self-esteem are essential for enabling students to feel valued and capable of facing challenges.

The implementation of specific quality of life programs adapted to the needs of students with intellectual disabilities has shown promising results. In their study, Lucas-Molina *et al.* [7] evaluated an emotional education intervention for young people with intellectual disabilities and found notable improvements in both emotional intelligence and social skills. These findings indicate that emotional education programs not only help students manage their emotions, but also facilitate the development of healthier social relationships, improving their adaptation to the school environment and their interactions with others. Taken together, these studies demonstrate the effectiveness of emotional education as a tool for promoting well-being and the holistic development of students with intellectual disabilities.

As Arrigoni and Solans [9] show through a social skills promotion program aimed at students with intellectual disabilities, it is possible to expand the repertoire of prosocial behaviors of participants. They also indicate that, by encouraging the development of communication skills, students were encouraged to display their creative abilities, which had a positive impact on their development and inclusion, as well as on their overall well-being. Previous study [10] highlighted that the university experience of students with disabilities improves significantly when they feel emotionally supported and when institutions adopt inclusive practices that take their emotional and social needs into account. Such support not only facilitates their adjustment to the academic environment, but also contributes to their general well-being. To achieve this, it is essential that educational staff receive training in emotional competencies, enabling them to identify and address students' emotional needs. Furthermore, the implementation of programs that promote a positive and respectful school climate is key to creating an inclusive and supportive environment.

These findings support the notion that targeted interventions can have a positive impact on the quality of life of students with intellectual disabilities. Educational programs specifically designed to address their needs have proven effective in improving emotional regulation, social adjustment, and academic performance within this population. However, the effectiveness of these programs largely depends on the training and competence of teaching staff, as evidenced in previous study [5], in which participants reported that teachers' willingness to listen, engage in dialogue, and acknowledge their emotions by conveying security and care constitutes some of the main factors promoting their well-being.

This study proposes an intervention aimed at university students with intellectual disabilities, based on the factors that promote socio-emotional development. The main objective is to analyze the possible effects of this intervention on the participants' self-perceived quality of life after their participation in the theoretical-practical module 'emotional skills and personal development'. This module is part of a university training program co-financed by the European Social Fund and the ONCE Foundation.

Although interest in programs aimed at improving quality of life has increased in recent years, empirical evidence focusing on university students with intellectual disabilities remains scarce. This limitation is particularly noticeable in research that incorporates pre-post designs and analyses the magnitude of the effect of interventions. In this context, the study offers preliminary evidence on the feasibility and potential impact of the proposal in a field that is still largely unexplored, including a systematic estimate of effect sizes in order to assess the practical relevance of the changes observed. The primary objective of this study is to evaluate the impact of a theoretical–practical intervention focused on socio-emotional competencies linked to personal development, which is structured around the regulatory principles of universal design for learning and instruction, on the quality of life of university students with intellectual developmental disorder and autism spectrum disorder.

As a first hypothesis, it is proposed that there will be differences in the perceived level of quality of life following the receipt of specific training in personal development. Secondly, it is hypothesized that the quality of life index (QLI), as well as the quality of life index percentile (QLIP) in the pre- and post-intervention measures, will be correlated with the degree of intellectual or developmental disability associated with autism spectrum disorder. Finally, it is posited that the differences between pre- and post-intervention measures of the QLI will be minimal across age groups and according to participants' gender.

2. METHOD

2.1. Research design

This research follows a quasi-experimental design with a quantitative approach. The study is characterized by a single-group pre-test–post-test design. An assessment is conducted of the impact of a theoretical–practical training program on levels of personal well-being and quality of life at two different time points: before and after participation in the training.

2.2. Participants

The target population comprises young people aged between 18 and 29 years who have been officially recognized as having a disability of at least 33% by the competent authority in their autonomous community, and who have a diagnosis of intellectual disability, developmental disorder, or autism spectrum disorder. The sampling procedure is non-probabilistic and based on convenience, as the sample comprises students who voluntarily agreed to participate in the study and who were enrolled in the University Extension Course in Urban Green Solutions at Rey Juan Carlos University. However, participants were required to meet specific criteria established by the European Social Fund Youth Employment Programme for the 2021–2027 period (identification code CCI 2021ES05SFPR001), as well as to undergo a psychoeducational assessment conducted by a multidisciplinary team. This assessment included, among other requirements, the demonstration of literacy skills, vocational interest, and motivation to participate in the training program.

The inclusion criteria established in the call were as: i) having an intellectual, developmental, and/or autism spectrum disability with a recognized degree of 33% or higher, certified by the competent authority of the Autonomous Community; ii) being aged between 18 and 29 years, inclusive; and iii) being a beneficiary of the National Youth Guarantee System prior to the start of the course. Additionally, an individualized psychoeducational assessment considered the following access criteria: i) possession of minimum and appropriate social and behavioral skills suitable for inclusion in a mainstream educational environment; ii) adequate academic skills in literacy and comprehension to ensure optimal participation in university-level training; iii) medium to high levels of independent mobility, even in cases where the student presents reduced mobility; iv) demonstrated vocational interest and motivation to undertake specialized training in the field of gardening, along with a high level of commitment or engagement with the course; and v) expressed interest in environmental conservation.

The sample is purposive and consists of 14 participants (N=14). The 14 participants correspond to the total number of students enrolled in the course. In this respect, the sample represents the full cohort of the specialized program mentioned previously in the sampling procedure. Of these, 28.57% are women (n=4) and 71.43% are men (n=10). In terms of age distribution, 57.14% (n=8) are aged between 18 and 20 years (born between 2003 and 2005), 14.28% (n=2) are aged between 21 and 25 years (born between 1999 and 2002), and 28.57% (n=4) are aged between 26 and 29 years (born between 1995 and 1998).

All participants in the sample present a disability affecting intellectual development, officially recognized by the competent authority of their autonomous community. According to the disability assessment scale, 14.28% (n=2) have a degree of disability between 33% and 40%, 28.57% (n=4) between 41% and 50%, 14.28% (n=2) between 51% and 60%, 35.71% (n=5) between 61% and 70%, and, finally, 7.14% (n=1) present a degree of disability above 71%. With regard to diagnostic categories, 7.14% (n=1) of the participants have a diagnosis of autism spectrum disorder, while 92.86% (n=13) have an intellectual disability. In all cases, the sample presents an impairment affecting intellectual development.

Furthermore, 50% of the sample (n=7) present comorbidity or mixed disability. Specifically, 42.85% (n=3) have attention deficit hyperactivity disorder (ADHD), 28.57% (n=2) present behavioral disorders, 14.28% (n=1) have comorbidity with hearing impairment, and an equal percentage (n=1) present neuromuscular system condition, specifically epilepsy. Finally, 42.85% (n=6) present only intellectual disability, and 7.14% (n=1) present only a diagnosis of autism spectrum disorder.

2.3. Variables

2.3.1. Independent variable

The specific training in emotional skills and personal development. This is a nominal dichotomous qualitative variable that takes the values yes or no. This training includes the theoretical–practical coverage of content related to the eight dimensions that comprise an individual's well-being and quality of life [11].

2.3.2. Dependent variable

The dependent variable in this study (an ordinal qualitative variable) refers to the level of quality of life of individuals with intellectual or developmental disabilities, understood as the desired state of personal well-being from the multidimensional perspective of the model composed of eight dimensions proposed by [11]. The core dimensions of the quality of life construct are understood as "the set of factors that make up personal well-being" [11].

The measurement of this variable is based on indicators associated with the core dimensions of quality of life, which include perceptions, behaviors, or life conditions that reflect an individual's well-being [11]. The operational definition of this variable, as provided by the INICO-FEAPS Scale [12], the instrument used for its measurement is presented in Table 1. It is an ordinal quantitative variable that takes values from 1 to 4, where the value 1 corresponds to the frequency descriptor "never" and the value 4 corresponds to the descriptor "always".

Table 1. Operational description of the INICO-FEAPS scale [12]

Dimensions	Indicators
Self-determination (SD)	Autonomy, goals, personal opinions and preferences, decisions and choices.
Rights (R)	Exercise of rights, knowledge of rights, intimacy, privacy, confidentiality.
Emotional wellbeing (EW)	Satisfaction with life, self-concept, absence of stress or negative feelings.
Social inclusion (SI)	Integration, participation and support.
Personal development (PD)	Training and apprenticeships, work competence, problem solving, daily living skills, technical aids.
Interpersonal relationships (IR)	Family relationships, social relationships, sexual-affective relationships.
Material wellbeing (MW)	Income, housing conditions, workplace conditions, access to information, possessions, services.
Physical wellbeing (PW)	Rest, hygiene, physical activities, leisure, medication, health care.

2.3.3. Control variables

Four control variables are considered in order to ensure that the relationships observed between the dependent and independent variables are more precise and meaningful. These are as:

- Degree of disability: this is an ordinal qualitative variable. It represents the percentage-based assessment of impairments, activity limitations, and participation restrictions experienced by the individual, as well as contextual factors and/or environmental barriers, established according to unified technical criteria set out in Annexes 1 to 6 of Royal Decree 888/2022 of 18 October [13], which regulates the procedure for the recognition, declaration, and classification of the degree of disability. The variable is expressed across five levels of severity (0–4), based on impairments in body functions and structures, limitations in activities, participation restrictions, and environmental contextual barriers: value 0 indicates a negligible problem (0%–4%); value 1 indicates a mild problem (5%–24%); value 2 corresponds to a moderate problem (25%–49%); value 3 is associated with a severe problem (50%–95%); and value 4 corresponds to a complete or total problem (96%–100%).
- Type of disability: this is a nominal qualitative (categorical) variable. The competent authority certifies the type or types of impairment which, together with other criteria, determine the recognized degree of disability. An impairment is understood as the loss or abnormality of body functions or structures

associated with limitations in the capacity to perform activities of daily living (ADL). Accordingly, the type of disability is defined with reference to the impairment component of body functions and structures, in accordance with the International Classification of Functioning, Disability and Health (ICF) [14], as well as the International Classification of Diseases, 11th revision (ICD-11) [15].
- Age group: this is an ordinal qualitative variable. It refers to predefined age ranges. Age represents the period of time from birth to the individual's current age and is categorized as: 18–20 years, 21–25 years, and 26–29 years.
- Gender: this is a nominal qualitative (categorical) variable. It refers to the individual's biological gender and is represented by the category's male and female.

2.4. Instrument of the study

The self-report version of the comprehensive quality of life assessment scale for individuals with intellectual or developmental disabilities (INICO-FEAPS Scale) [12] was administered. The analysis of the metric quality of this instrument indicates adequate psychometric properties. It consists of 72 items, organized into eight dimensions, with nine items per dimension, which collectively define the concept of quality of life. Responses are recorded using a four-point Likert-type frequency scale: never, sometimes, frequently, and always.

The estimated administration time for this instrument is approximately 45 minutes and it is to be completed by individuals with intellectual or developmental disabilities, provided that they possess sufficient expressive and receptive skills to ensure comprehension of both the item statements and the response options. In the present study, and in accordance with the recommendations of [12], the presence of an interviewer to guide the administration was required, as well as a support person to provide the necessary assistance to ensure adequate understanding of the items and the response format.

To facilitate comprehension, and based on the second principle of universal design for learning-multiple means of representation [16] a visual key was incorporated to represent each response option. The never option is represented by a rectangle shaded in one quarter; sometimes is represented by two shaded quarters; frequently by three shaded quarters; and always by a fully shaded rectangle. This instrument yields several scores to be considered in subsequent data analysis: raw scores are converted into standard scores, a composite standard score or QLI, as well as percentile ranks for the standard scores of each of the eight dimensions and the percentile rank of the QLI.

2.5. Statistical analysis

Data analysis was conducted using the IBM SPSS statistical software package, version 29. Descriptive statistics of central tendency (mean, mode, and median) and dispersion (standard deviation and range) were calculated for the standard scores and percentile ranks of the standard scores for each of the eight dimensions of the dependent variable. Given the sample size ($n=14$), which is considered small ($n<30$), the non-probabilistic nature of the sampling procedure, and the assumption that the data do not meet the normality assumption, non-parametric statistical tests were employed. A confidence level of 95% was assumed, with a statistical significance threshold set at .05 ($p<.05$).

To test the first hypothesis regarding potential differences in quality of life between pre- and post-intervention measurements, the non-parametric alternative for comparing population means was used: the Wilcoxon signed-rank test (Z), along with the calculation of effect size (r). The second hypothesis of the study, concerning differences in quality of life as a function of the degree of disability, was examined by calculating Spearman's rank correlation coefficient, as well as by applying the Kruskal–Wallis H test for k independent samples. Finally, to test the last hypothesis, the Kruskal–Wallis H test for k independent samples and the Mann–Whitney U test for two independent samples were applied to examine whether the QLI varied significantly according to participants' age group (a polytomous variable) and gender (a dichotomous variable), respectively.

3. RESULTS AND DISCUSSION

3.1. Results

Descriptive statistics for each of the eight dimensions of the dependent variable, as well as the total standard score for each assessment (PRE and POST), are presented in Table 2. It can be seen that the average and median values are higher in the post-assessment of quality of life. Meanwhile, the range and standard deviation are higher in the POST assessment, which implies, on the one hand, a greater distance between the minimum and maximum values obtained in the standard scores and, on the other hand, greater dispersion with respect to the average.

Table 3 shows the descriptive and central tendency statistics for the QLI and the QLIP of the group participating in the pre- and post-assessments. Based on the descriptive statistics of the QLIP, very low values are observed with respect to the independent reference population at the time of assessment, with percentiles below 30%. This implies that the self-perceived quality of life of the group of participants is below 30% with respect to their reference population group.

Table 2. Descriptive statistics and central tendency statistics for quality of life (N=14)

Dimensions	PRE					POST				
	x	Mo	Md	Sd	R	x	Mo	Md	Sd	R
Self-determination	9.79	8	9	2.01	6	10.79	12	12	2.46	9
Rights	7.36	9	7.5	2.17	8	8.21	9	9	2.72	9
Emotional wellbeing	6.64	5	6	2.82	11	8.21	5	7	3.53	10
Social inclusion	5.57	3	5	2.44	9	7.36	5	6.5	3.43	11
Personal development	8.86	8	8	2.45	9	9.57	8	9.5	2.34	8
Interpersonal relationships	8.43	10	8	1.74	6	10.50	9	9.5	2.79	9
Material wellbeing	5.14	5	5	1.83	7	6.93	7	6.5	3.45	12
Physical wellbeing	3.86	2	2.5	2.83	8	6.29	6	6	3.29	11
Total	55.64	45	52.50	10.76	34	67.86	63	63	16.65	50

Table 3. Descriptive and central tendency statistics for the quality of life index and its percentile (N=14)

INICO-FEAPS	PRE					POST				
	x	Mo	Md	Sd	R	x	Mo	Md	Sd	R
QLI	77.86	75	68	9.81	31	89	85	85	14.98	45
QLIP	10.93	2	5	13.39	46	27.79	7	13	30.87	86

To determine whether there are statistically significant differences between the standard scores for each of the dimensions of the quality of life variable, as well as between the total standard scores between the two assessment times, the Wilcoxon Z test is applied. If p<.05, the null hypothesis of equality of means is rejected, concluding that there are statistically significant differences between the two measurements. The effect size helps to estimate the magnitude of the observed effect by eliminating random noise. Values close to 0 imply a minimal effect, while values close to 1 or –1 imply a strong effect size. These results are shown in Table 4.

Although statistically significant differences only exist in three dimensions of the dependent variable quality of life (pSI<.032; pIR<.027; pPW<.015), the relevance of the changes between the pre- and post-measures fluctuates between a medium and strong effect in all dimensions of this variable. In any case, paying attention to both the differences between the pre- and post-measures in the total standard score variables, QLI (or composite standard score), as well as the percentile of the QLI, not only statistically significant differences (p<.001) are noted, but the effect size between the two measurements is strong (r=-.88) (|r|>.5 implies a strong effect).

Table 4. Wilcoxon test of the quality of life variable (pre/post)

Standard scores (pre/post)	Z[a]	Bilateral asymptotic significance	r
Self-determination	-1.347	.178	-.36
Rights	-1.615	.106	-.43
Emotional wellbeing	-1.572	.116	-.42
Social inclusion	-2.149	.032	-.57
Personal development	-1.168	.243	-.31
Interpersonal relationships	-2.207	.027	-.59
Material wellbeing	-1.581	.114	-.42
Physical wellbeing	-2.426	.015	-.65
Total	-3.304	<.001	-.88
QLI	-3.300	<.001	-.88
QLIP	-3.298	<.001	-.88

Note: Test statistics based on Wilcoxon signed-rank test. [a]Based on negative ranges.
Z: Statistical value of the Wilcoxon test; N=14. The effect size (r) was calculated using the formula $r=Z/\sqrt{N}$. The interpretation of the effect size was carried out following Cohen's guidelines: small (≥.10), medium (≥.30), and large (≥.50). The values are interpreted in absolute terms.

The results of the Spearman correlation coefficient (r) calculation are presented to test whether there is a relationship between the degree of disability variable and the quality of life variable at the two assessment points. If the statistical significance value is less than .05 (p<.05), the null hypothesis is rejected, assuming that there is a correlation between the variables studied. The positive (+) or negative (-) value of Spearman's coefficient will determine the direction of the relationship (inverse or direct). The results are shown in Table 5.

Table 5. Spearman's Rho correlation coefficient (N=14)

Spearman's Rho coefficient		Pre-evaluation		Post-evaluation	
		QLI_{PRE}	$QLIP_{PRE}$	QLI_{POST}	$QLIP_{POST}$
Degree of disability	Correlation coefficient	.186	.099	.293	.282
	Significance (bilateral)	.523	.738	.310	.329

The calculation of Spearman's Rho coefficient indicates that there is no correlation between the QLI or the QLIP and the degree of disability variable. To test the hypothesis regarding differences between pre- and post-measures according to degree of disability, the Kruskal-Wallis H test was applied. The results are shown in Table 6. It can be observed that there are no statistically significant differences in the QLI in the pre- and post-measurements based on the degree of disability of the students (p>.05). Next, the Kruskal-Wallis H test is applied to determine whether there are differences in the QLI between the different age groups. These results are shown in Table 7.

Finally, the Mann-Whitney U test allows us to check whether the QLI varies significantly according to the gender of the participants. The results of the test statistic are shown in Table 8. These two tests show that there are no statistically significant differences in the QLI (pre- and post-) based on age group or gender, as the level of statistical significance is greater than .05 (p>.05).

Table 6. Kruskal-Wallis H test (quality of life index vs. degree of disability) in pre- and post-measures

Time for evaluation		QLI	QLIP
PRE	Kruskal-Wallis H	2.897	2.516
	fd	2	2
	Asymptotic significance	.235	.284
POST	Kruskal-Wallis H	1.238	1.137
	fd	2	2
	Asymptotic significance	.538	.566

Note. N=14. fd: freedom degrees.

Table 7. Kruskal-Wallis H test (quality of life index vs. age group) in pre- and post-measurements

Time for evaluation		QLI	QLIP
PRE	Kruskal-Wallis H	.248	.590
	fd	2	2
	Asymptotic significance	.883	.745
POST	Kruskal-Wallis H	.542	.678
	fd	2	2
	Asymptotic significance	.763	.712

Note: N=14. fd: freedom degrees; Age group (years): 18-20, 21-25, and 26-29.

Table 8. Mann-Whitney U test (quality of life index vs. gender)

	Pre-evaluation		Post-evaluation	
	QLI_{PRE}	$QLIP_{PRE}$	QLI_{POST}	$QLIP_{POST}$
Mann-Whitney U	9	11	8	10.5
Asymptotic significance (bilateral)	.119	.201	.082	.178

Note: N=14. Gender group: man and woman.

3.2. Discussion

Although the results show statistically significant changes in several dimensions of quality of life, these findings should be interpreted with caution due to the small sample size (N=14). The limited statistical power increases the risk of Type II errors, i.e., the possibility of failing to detect real effects in those dimensions that did not reach statistical significance. Consequently, the absence of significance in some variables does not necessarily imply an absence of effect, but could reflect insufficient statistical power.

It should also be noted that in small samples, effect sizes tend to be more variable and unstable, which can lead to inflated estimates. This phenomenon has been documented in methodological studies that warn that when N is small, coefficients based on Z statistics may overestimate the actual magnitude of the population effect. Therefore, the high values observed should be interpreted as preliminary estimates that are subject to adjustment in larger samples.

Regarding the interpretation of 'medium' and 'strong' effects, it is important to note that the conventional cut-off points proposed [17] were developed as general guidelines and not as absolute standards. In small samples, a value classified as 'large' may not necessarily reflect a social impact equivalent to that observed in studies with greater statistical power. Therefore, the categorization should be understood as indicative and contextualized.

In this regard, analysis of the data obtained using the INICO-FEAPS scale shows an improvement in all dimensions assessed after training. The results suggest that the intervention had a positive impact, evidencing advances in key areas fundamental to the development of individuals with intellectual disabilities and autism spectrum disorder. In particular, progress was observed in aspects related to participants' quality of life and personal well-being, reinforcing the hypothesis that the adopted approach was beneficial. These findings are consistent with previous research demonstrating the effectiveness of programs designed to enhance self-determination and well-being in individuals with intellectual disabilities. Previous studies [18], [19] provide evidence that interventions focused on developing these essential skills can lead to meaningful improvements in the lives of people with intellectual disabilities. Overall, the results indicate that such programs are effective in promoting inclusion, autonomy, and general well-being for individuals with intellectual disabilities and autism spectrum disorder.

The increase observed in the self-determination dimension indicates that participants improved their ability to make autonomous decisions, thereby strengthening their independence and responsibility. This is crucial for personal autonomy. These results align with Wehmeyer *et al.* [19], who associate self-determination with higher quality of life, greater social participation, and overall well-being. Developing this skill not only enhances daily living but also facilitates inclusion and active participation in society.

The increase in the rights dimension reflects greater awareness among participants of their fundamental rights and their capacity to exercise them. Promoting awareness of rights is essential for social inclusion and active participation [20]. Recognition and respect for one's rights provide the tools necessary to access personal, social, and professional development opportunities. Moreover, strengthening this awareness not only enhances self-esteem but also supports more equitable inclusion across different domains.

Similarly, emotional well-being and social inclusion showed improvements, supporting the effectiveness of the intervention. In particular, the increase in emotional well-being suggests greater stability and an improved capacity to manage emotions, contributing to resilience and overall quality of life. These findings are consistent with previous study [21], which link self-determination with mental health. Strengthening self-determination, therefore, not only positively impacts autonomy but also influences emotional well-being and social integration for individuals with intellectual disabilities. Likewise, social inclusion also improved. This increase supports the idea that structured, targeted programs can facilitate active participation in the community, promoting inclusion and reducing social barriers that might limit access to opportunities. Social inclusion is an essential component of personal development, as it enables individuals with disabilities to establish meaningful connections, develop social skills, and participate in community life [22]. Taken together, these results highlight the positive impact of the intervention on both emotional well-being and social inclusion, two key factors for the holistic development of participants.

Personal development, interpersonal relationships, and material well-being also showed improvements, underscoring the importance of a comprehensive approach to enhancing quality of life. These findings support the perspective of [23], who emphasize that personal skills, healthy relationships, and access to material resources are fundamental to the well-being of individuals with intellectual disabilities. The intervention facilitated personal and social growth, strengthening autonomy and participation in daily life.

Physical well-being also increased, suggesting a positive impact of the intervention on participants' health. This is consistent with previous studies linking physical activity to general well-being [24]. This progress may be attributed to the physical activity and sports module of the Urban Green Solutions program at Rey Juan Carlos University, designed to enhance physical skills and promote an active lifestyle. This component, focused on improving physical abilities and fostering activity, likely contributed to the scores in this dimension.

It is also noteworthy that degree of disability, gender, and age did not have a significant effect, reaffirming the conception of quality of life as a multidimensional construct requiring a holistic approach [25]. Such an approach must integrate key dimensions, including self-determination, rights, emotional well-being, social inclusion, personal development, interpersonal relationships, material well-being, and physical well-being, thereby ensuring the personal development of these individuals [26].

Despite the differences observed between pre- and post-intervention phases, the percentile values of the QLI were, in most cases, below 40%. This underscores the urgency of implementing strategies that comprehensively address the quality of life of young people with intellectual disabilities and autism spectrum disorder [23]. While the improvements are evident, this finding indicates that there remains considerable progress to be made in achieving optimal well-being for this population, highlighting the importance of continuing to implement and refine educational and training programs tailored to their needs, with a comprehensive and personalized approach.

4. CONCLUSION

This study shows that the implementation of the program has had a positive impact on the students. However, the results should be interpreted with caution, as the composition of the sample does not allow for the isolation or specific analysis of participants with ASD, nor of those presenting other comorbid disorders. Consequently, the data obtained do not allow for particular conclusions to be drawn about this group, but only for the effects of the program to be interpreted at a general level across the cohort of students analyzed.

With regard to the hypotheses, the data confirm the first hypothesis, as they show improvements in the perception of quality of life following the personal development training, which suggests an increase in their well-being. Conversely, the second hypothesis could not be confirmed, as no significant relationship was found between perceived quality of life and the degree of intellectual disability or autism spectrum disorder. Furthermore, the percentile values obtained were lower than expected, indicating the potential influence of other factors. Similarly, no statistically significant differences were observed in the pre- and post-intervention measurements according to participants' age or gender, leading to the rejection of the third hypothesis.

These findings highlight the need for further research into the factors influencing the quality of life of this population and the effectiveness of interventions aimed at their personal development. Although the observed differences are not statistically significant, the results suggest improvements in participants' skills, emphasizing the importance of continuing such programs. Therefore, this study should be considered exploratory in nature, aimed at identifying preliminary trends rather than establishing definitive conclusions. From this perspective, the findings constitute initial evidence that justifies future research with controlled designs, incorporating control groups, larger sample sizes, and longitudinal designs with follow-up, in order to estimate more accurately the actual magnitude of the effects and their temporal stability.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Nerea Felgueras Custodio	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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José David Carnicero Pérez	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest in relation to this research.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The research related to human use has been complied with all the relevant national regulations and institutional policies in accordance with the tenets of the Helsinki Declaration, and has been approved by the ethics committee of Rey Juan Carlos University.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [JML-D], upon reasonable request. The data, which contain information that could compromise the privacy of research participants, are not publicly available due to certain restrictions.

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