Original article

Main changes in biopsychosocial aspects of Chilean teenagers after two years of remote emergency teaching

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Abstract

The lockdown during the COVID-19 pandemic was an adjustment process in life for everyone. The aim of this research, framed in the thesis of Social Work of the University of Concepción "Main changes in the biopsychosocial development of teenagers from the commune of Coronel, after two years of remote emergency teaching ", was to explore and describe the changes following emergency remote teaching in biopsychosocial aspects of adolescents. The following variables were analyzed in three dimensions. In the Biological Dimension, physical activity, diet behavior, and sleep quality were measured. The Psychological Dimension addressed feelings of life satisfaction, positive mental well-being, and moods and feelings. Finally, the social dimension assessed social participation.

A quantitative methodology was proposed, with a descriptive, relational, and transversal design. The sample was composed of 194 students between 14 and 18 years of age, from five educational establishments of municipal dependence of the commune of Coronel, Biobío region, Chile. For data collection purposes, a self-administered questionnaire was used. The results indicated that the main changes in the lives of adolescents were observed in the areas of physical activity, positive mental well-being, and social participation; in turn, men presented a greater positive mental well-being than women.

Keywords: Biopsychosocial model; Adolescents; Pandemic; Emergency remote teaching.

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Principales cambios en aspectos biopsicosociales de adolescentes chilenos tras dos años de docencia remota de emergencia

Resumen

El confinamiento durante la pandemia de la COVID-19 fue un proceso de ajuste en la vida de todo el mundo. El objetivo de esta investigación enmarcada en la tesis de Trabajo Social de la Universidad de Concepción "Principales cambios en el desarrollo biopsicosocial de adolescentes de la comuna de Coronel, tras dos años de docencia remota de emergencia", consistió en explorar y describir los cambios tras la docencia remota de emergencia en aspectos biopsicosociales de adolescentes. Para ello se analizaron las siguientes variables en tres dimensiones. En la Dimensión Biológica se midió actividad física, comportamiento de dieta y calidad del sueño. En la Dimensión Psicológica se abordó sensación de satisfacción con la vida, bienestar mental positivo y estados de ánimo y sentimientos. Por último, en la Dimensión Social se evalúo la participación social.

Se planteó una metodología cuantitativa, con un diseño descriptivo, relacional y transversal. La muestra estuvo compuesta por 194 estudiantes entre 14 a 18 años de edad, de cinco establecimientos educativos de dependencia municipal de la comuna de Coronel, región del Biobío, Chile. Para efectos de la recolección de datos se aplicó un cuestionario autoadministrado. Los resultados indicaron que los principales cambios en la vida de los adolescentes se observan en las áreas de actividad física, bienestar mental positivo y participación social; a su vez, que los hombres presentan un mayor bienestar mental positivo que las mujeres.

Palabras clave: Modelo biopsicosocial; Adolescentes; Docencia remota de emergencia; Pandemia.

Summary: 1. Introduction, 2. Methodology, 3. Findings, 3.1 Sociodemographic characterization, 3.2 Biological dimension, 3.3 Psychological dimension, 3.4 Social dimension, 3.5 Differences according to sex in aspects that demonstrated greater variation, 4. Conclusions, 5. Bibliographic references.

1. Introduction

On December 31, 2019, the World Health Organization (WHO) was notified of an outbreak of pneumonia in Wuhan, a city in Hubei province, China, of unknown etiology. It did not respond to medical treatments used. In a few days, infection levels increased exponentially in China and different countries (Koury & Hirschhaut, 2020). In this context, governments adopted measures to mitigate the spread of the disease in their territories and strengthen health systems (Gutiérrez-Cortez & Zapata-Giraldo, 2022).

In Chile, the first case was confirmed on March 3, 2020, growing abruptly to 1,142 cases and three deaths associated with COVID-19 on March 25, 2020, according to the epidemiological reports of the Ministry of Health. The first measures implemented in the country to stop the virus outbreak began on February 5, 2020, through the promulgation of Decree 4/2020 issued by the Ministry of Health, which allowed the establishment of a National Health Alert (which remained until August 31, 2023). Subsequently, through Decree 104/2020 of the Ministry of the Interior and Public Security, on March 18, 2020, the State of Constitutional Exception of Catastrophe due to Public Calamity was established by the provisions of Article 41 of the Political Constitution of the Republic, whose regulations gave the authorities the power to suspend public events of more than 500 people, the closure of educational establishments, the establishment of a curfew and quarantines to reduce the mobility of the population. The ruling lasted ninety days and was extended five times until September 30, 2021 (Ministerio de Salud de Chile [MINSAL], 2022).

Resolution 180 Exenta/2020 of the Ministry of Health determined the suspension of classes as of March 16, 2020, for an initial period of two weeks. This measure was extended until April 10 through Resolution 217 Exempt/2020, issued on March 30 by the same entity. Subsequently, the Ministry of Education anticipated winter holidays, setting them from April 13 to 24. Finally, Resolution 322 Exenta/2020 of April 28, issued by the Ministry of Health, ordered the suspension of classes in all kindergartens and educational establishments in the country, enabling the continuity of providing educational services remotely. Subject to the criteria established by the Ministry of Education until health conditions allow this measure to be lifted.

As a result, the educational system in 2020 is forced to recondition its teaching strategies to adapt to the health crisis. In this way, reference is made to the term *Emergency Remote Teaching* (from now on ERT), differentiating the learning experiences and design institutions implemented during the pandemic from other strategies, such as online education (Misirli & Ergulec, 2021). While the latter uses a systematic planning model to design and develop classes, this process needs to be present in emergency remote teaching since the situation responds to a moment of urgency. Hodges *et al.* (2020), who coined this concept, propose that the goal is not to produce a robust educational ecosystem but rather to reliably provide educational support and temporary access during an emergency or crisis.

Although Emergency Remote Teaching is less rigid than online learning, the same challenges that can be found in a system that has never transitioned to distance education would arise (Toquero, 2020). According to Marinoni *et al.* (2020), in this context, the differences in the student environment become evident, for example, in Internet accessibility, whether due to equipment availability or connectivity. Therefore, one of the difficulties in this scenario is the inequity in access to computer technologies among students, accentuating the differences in opportunities to continue the training process (Didriksson *et al.*, 2021).

On the other hand, Portillo-Peñuelas *et al.* (2020) refer to the difficulties identified by students in carrying out their activities during the emergency remote teaching period, among which the lack of technological resources, little commitment from a state agency, and not considering the appearance of other problems stand out individuals and families since the pandemic. The latter is relevant since during this process (which extended until 2022), the students saw their daily life dynamics and their different personal spheres affected by having to live together in the same place constantly (Rodríguez-Pizarro *et al.*, 2022) and develop various actions in their home, which used to be carried out outside and in connection with other people.

Through its Study Center, the Ministry of Education of Chile (MINEDUC, 2021) detailed various impacts of the transition from face-to-face classes to the virtual modality in response to the COVID-19 pandemic. The report highlights negative consequences on students' learning processes, a significant increase in dropout and school exclusion rates, and a decrease in comprehensive support resources provided by schools (including nutrition, psychological support, and well-being). In addition, adverse effects on the mental health of students and an increase in the workload and stress experienced by teachers are reported.

Adolescence

Added to the complications that this process involves, it is essential to recognize that the stage in which the study population finds itself corresponds to a sensitive period of life. Adolescence represents a stage of development in which physical, cognitive, and psychosocial growth is experienced, influencing how they feel, think, make decisions, and interact with their environment (World Health Organization [WHO], 2022). During this period, the individual goes through a series of physical and psychological changes, with confusion and a search for identity. Likewise, there is greater distancing from parents, closer proximity to peers, and progress towards independence (Bordignon, 2005). A fundamental aspect is that practically everything revolves around their social life: meetings with friends, sharing tastes with their peers, participating in extracurricular and/or religious activities, and possibly relationships. For this reason, the measures adopted to combat COVID-19, primarily aimed at social isolation, abruptly modified their social habits (Rodríguez-Rodríguez, 2021).

Based on Erikson's Theory of Psychosocial Development, adolescence corresponds to the fifth stage, identity versus role confusion (Bordignon, 2005), where the search for identity takes precedence in all areas (psychosexual, ideological, psychosocial, professional, cultural, and religious). According to Erikson (2000), adolescents resolve a normative crisis as part of their development process. This is relevant since this research addresses the changes of adolescents after experiencing the pandemic; therefore, it must be considered that this age group faced at the same time not only the external challenges of the global crisis but also an internal crisis typical of the life cycle stage.

Biopsychosocial model

The dimensions in which changes are analyzed are based on the biopsychosocial model, which, according to Borrell i Carrió (2002), was proposed by George L. Engel in 1977, referring to how important it was to build a new holistic health model that could consider in addition to the biological aspects, the psychological and social ones. This proposal opposed the biomedical model, which was dominant in the industrialized societies of the time. It is framed in the General Systems Theory, representing a comprehensive model where each of the systems influences the others and, in turn, is influenced by the others (Juárez, 2011). In this context, Vanegas-García and Gil-Obando (2007) state that any biological or psychosocial alteration can determine a person's well-being.

Bolton and Gillet (2019) studied how the content of Engel's biopsychosocial model is currently addressed, concluding that the phenomena of society, which had been established premises in its original text, today have increased considerably, such as the economy, globalization, and sociocultural changes. In addition, they emphasize international policies to manage epidemics and pandemics, which, as is evident, can spread quickly. At the same time, they point out that the increase in research in the area reinforces Engel's approaches because, in various diseases, the causes or risks are combinations of biological, psychological, and social factors (Bolton & Gillet, 2019).

On the other hand, Al-Sabbah *et al.* (2021) recognize it as a series of factors encompassing diseases, feelings, thoughts, behaviors, family relationships, and work environment. In that sense, the authors understand this concept from a systemic perspective, whereas, in the context of a health crisis, not only should the emphasis be placed on biochemical issues, such as the control of diseases and viruses, but also especially support more vulnerable people who suffer from mental and emotional disorders, and/or who are facing crises. Personal. In this regard, the authors list a series of factors that could influence the lives of adolescents. In the physical dimension, they raise weight gain, fatigue, headaches, tachycardia, repetitive colds, energy to carry out activities, and hours of insufficient sleep to rest. In the psychological dimension, they recognize situations such as depressive states, poor management of emotions, poor concentration, weakening of short-term memory, anxiety, motivation/demotivation, stress, and/or negative

thoughts. Finally, in the social dimension, the authors refer to social isolation, the influence of the family on the individual, the quality of relationship with friends, maintenance or change of goals for the future, aggressiveness with others, and obsessive behavior (Al-Sabbah *et al.,* 2021).

Although this model was born in the health field, for the purposes of this research, it allows us to understand how these three dimensions are part of the lives of adolescents due to the presence of biological and psychosocial alterations typical of the stage studied and the constant interrelation between the three dimensions.

From the above, the question arises: *¿What are the main changes in the three dimensions of adolescents' lives after emergency remote teaching?* For this reason, the general objective of the research was to explore and describe the main changes in biopsychosocial aspects of adolescents from the city of Coronel, having spent two years of emergency remote teaching. In this sense, the specific objectives sought to 1) Characterize the adolescents participating in the study, 2) Identify and describe the aspects that were affected in each of the three dimensions (biological, psychological, and social) and 3) Know the differences according to sex in the aspects with the most significant variation of each dimension. The hypothesis supported by empirical evidence indicates that male students have better total scores than women regarding positive mental well-being.

It is essential to highlight that this study considers emergency remote teaching as a context and not as a variable that causes the changes, taking into account the scope, which is mainly descriptive.

The research was temporarily conducted between March and November 2022, and geographically in the city of Coronel, Biobío region, Chile, a city in which complex situations have been evident within educational institutions after the return to in-person attendance, which made national news (T13, 2022).

2. Methodology

The research used a quantitative methodology, with a non-experimental approach, a descriptive-relational design, and is cross-sectional (Hernández-Sampieri *et al.,* 2014), so the data was obtained in a single measurement with a retrospective view (Cabrera *et al.*, 2014), having spent two years of remote teaching.

The sample was non-probabilistic, for convenience and by quotas, in which the elements do not depend on probability but on the possibility of access to the data. One hundred ninety-four students from five municipal schools (High schools) participated.

The inclusion criteria were being a secondary student from a municipal establishment in Coronel between 14 and 18 years old and having had remote classes between 2020 and 2021. Students under 14 and over 2021 were excluded. Eighteen years old, and those who did not have the authorization of their tutor.

The data collection technique was a survey, while the instrument corresponds to a self-administered questionnaire composed of four sections. The first is *sociodemographic characterization*, with questions about sex, age, grade, and educational establishment. The second addresses *the biological dimension*, incorporating *Physical activity*, *Diet behavior, and sleep quality*. The third section contemplates the *psychological dimension: Feeling of satisfaction with life, Positive mental well-being, and Moods and feelings*. Finally, in the social dimension, the variable *social participation* is measured. The instrument was mainly based on the research instrument "Effects of Home Connement on Multiple Lifestyle Behaviors During the COVID-19 outbreak (ECLB-COVID19)" by Ammar et al. (2020), which corresponds to a series of brief validated and/or crisis-oriented questionnaires, showing good to excellent test re-test reliability coefficients (r = 0.84–0.96) (Ammar et al., 2020).

Based on the research objectives, the emphasis on the descriptive, and considering the study by Ammar *et al.* (2020), the instrument incorporated a question on physical activity and five scales from the ECLB-COVID19: Pittsburgh Sleep questionnaire. Quality Index (PSQI) to measure sleep quality, Short Life Satisfaction Questionnaire for Lockdowns (SLSQL) for Feeling of satisfaction with life, Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS) for Positive mental well-being, Short Mood and Feelings Questionnaire (SMFQ) for Moods and Feelings, and Short Social Participation Questionnaire for Lockdowns (SSPQL) for social participation. The results of the scales are presented descriptively and through a significance test to determine their variation. Finally, three items from the Short Diet Behaviors Questionnaire for Lockdowns (SDBQ) scale were applied for diet behavior, which responds to the research team's interest, descriptively addressing these results according to each item presented.

Data was collected between September and October 2022, asking participants to place themselves in context during emergency remote teaching and currently in each question.

Prior to data collection, a pilot test was applied to 5 students, where it was determined that the approximate response time was 15 minutes, that no question confused the participants, and that the instruction to position themselves retroactively during the emergency remote teaching period and in the current period, it was understood without problems.

Data was processed in the SPSS statistical program through univariate and bivariate analysis.

Regarding ethical aspects, informed consent was presented to the guardians (parents or tutors), and informed assent was given to the adolescents authorized to participate. To protect anonymity, each questionnaire was assigned a folio number. Finally, to request the corresponding authorization to collect data in the commune's establishments, a formal request is issued to the Municipal Education Directorate (MED) of Coronel.

3. Findings

3.1 Sociodemographic characterization

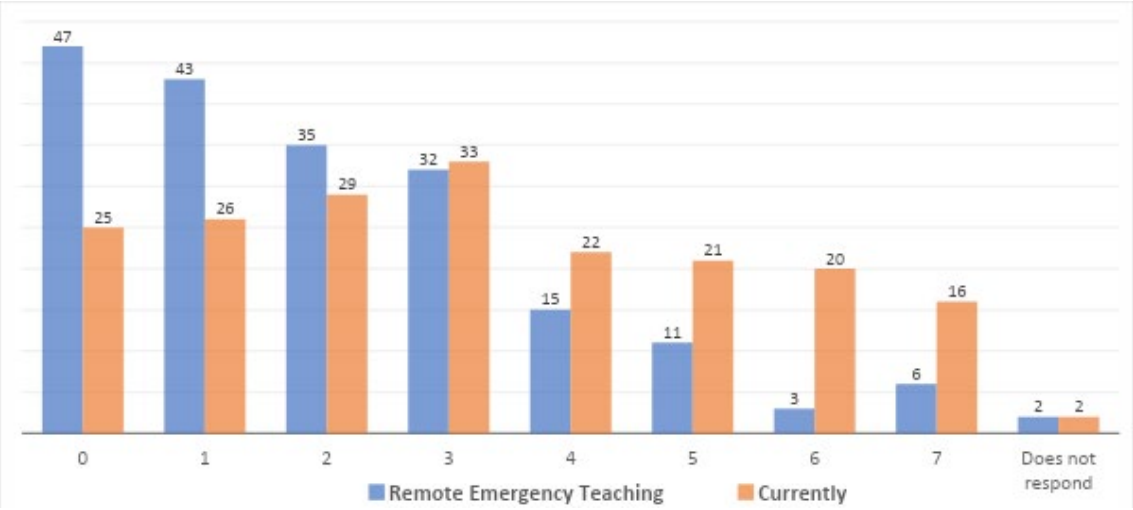
One hundred ninety-four adolescents made the sample, primarily women (49.5%), followed by men (44.8%) and adolescents who did not identify with any of the previously mentioned categories (5.2%). 28.4% of the adolescents surveyed are over 17 years old, the highest response percentage. The average age of the sample is 16 years. Concerning the level (course), it was intended that each one would have a similar distribution. Considering that secondary education addresses the first, second, third, and fourth years in Chile, the distribution was 24.7%, 25.8%, 24.2%, and 25.3%, respectively. With municipal educational establishments, the same criteria were applied as with the course since the Liceo Bicentenario concentrates 20.1% of responses, the Liceo Antonio Salamanca 20.1%, the Liceo Yobilo 19.6%, the Liceo Andrés Bello 19.6%. And the Rosita Renard High School 20.6%.

Below, in the figure 1 the three dimensions studied are presented and measured according to the responses during the emergency period of remote teaching.

3.2 Biological dimension

3.2.1 Physical activity

Figure 1. Number of days per week engaged in physical activity (during emergency remote teaching and currently). N=194.



Source: Own elaboration, 2022.

During the emergency remote teaching period, the majority (24.2%) was concentrated in students who did not do physical activity (0 days a week). Meanwhile, it currently stands three days a week, representing 17%.

It is essential to highlight that the "0 days" category demonstrates the most significant variation in response compared to the comparison of both moments, with a difference of 11.3%. Adolescents perform some physical activity with an average of 2.07 days during the ERT and 3.23 days currently. When performing the analysis using the Student T test, it is verified that there are significant differences between the means of both periods (t=6.95, p=.001).

3.2.2 Diet behavior

Table 1. Diet behavior during emergency remote teaching and currently. N=194.

Diet Behavior		Never		Sometimes		Most of the time		Always		Total	
		Fi	%	Fi	%	Fi	%	Fi	%	Fi	%
How likely was/is it to have an unhealthy diet/food? (high in calories from sugar or fat, for example: chips, cakes, white sauces, etc.)	ERT	14	7.2	105	54.1	57	29.4	18	9.3	194	100
	Curr.	18	9.3	142	73.6	23	11.9	10	5.2	193*	100
How often has it occurred realize you are eating out of control (binge eating)?	ERT	62	32	66	34.0	48	24.7	18	9.3	194	100
	Curr.	56	29	74	38.3	45	23.3	18	9.3	193*	100
Do you consume excessively alcohol? (5 or more drinks alcoholic in a week)	ERT	162	83.5	27	13.9	4	2.1	1	0.5	194	100
	Curr.	148	76.3	35	18.0	7	3.6	4	2.1	194	100

* Frequency *Does not respond* =1. **Source:** Own elaboration, 2022.

Regarding the intake of unhealthy food, it is observed that the categories *usually* decrease today. However, the percentage of the majority in both periods corresponds to the *sometimes* category. Through the Student's T test, it is confirmed that these differences are significant (t=-4.55; p=<.001).

The frequency of consumption of out-of-control foods is mainly in the sometimes category (34 % ERT and 38.3% current) in both periods. The Student's T-test allows us to verify that the differences are not significant (t=.22; p=.82).

Al-Sabbah *et al.* (2020) state that the tendency to eat more unhealthy foods is one of the biological factors that are linked to the well-being of students, since it negatively affects psychological and social aspects, such as feelings and family relationships.

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Regarding excessive alcohol consumption, in both contexts, the majority of adolescents expressed that they never engaged in such behavior. (83.5% during the ERT and 76.3% in the current period). These differences are significant according to the Student's T-test (t=3.37; p=<.001). At this point, Miech *et al.* (2021) propose that the decrease in alcohol consumption during the pandemic would be related to the perceived availability of the product by adolescents during periods of confinement.

3.2.3 Sleep Quality

Bedtime was concentrated during the post-ERT at 01:00 a.m. (61.3%). This trend continues today. However, it is distributed more heterogeneously between said hours (35.1%) and between 11:00 p.m. and 12:00 a.m. (33.5%). Using the Student's T test, it is confirmed that there are significant differences between the means of both periods (t=-7.06, p=<.001).

Regarding the consumption of sleeping medications, in both periods, most adolescents indicated not consuming them (83% ERT and 76.8% currently), data that agrees with the statistical test since no significant differences are evident (t= -1.31; p=.19).

Regarding problems staying awake during the day, both in the ERT period and currently, the percentage majorities (42.3% and 46.4%, respectively) indicate that adolescents did not present these problems, which is corroborated by applying the Student's T test (t= 1.86; p=.06).

Table 2. Reasons linked to problems falling asleep during the emergency remote teaching period and currently. N=194

How often do you have had problems to sleep because of.		None		Once or twice a week		Three or more times a week		Total	
		Fi	**%**	**Fi**	**%**	**Fi**	**%**	**Fi**	**%**
Can't fall asleep in 30 minutes	ERT	63	32.8	56	29.2	73	38.0	192*	100
	Curr.	62	32.3	70	36.5	60	31.3	192*	100
Wakes up in the middle of the night or early in the morning	ERT	73	37.6	79	40.7	42	21.6	194	100
	Curr.	50	25.8	81	41.8	63	32.5	194	100
Have to wake up to use the toilet	ERT	85	43.8	74	38.1	35	18.0	194	100
	Curr.	81	41.8	77	39.7	36	18.6	194	100
Can't breath comfortably, coughs or snores	ERT	158	81.4	24	12.4	12	6.2	194	100
	Curr.	143	73.7	40	20.6	11	5.7	194	100
Feels too cold/hot	ERT	66	34.0	95	49.0	33	17.0	194	100
	Curr.	61	31.4	89	45.9	44	22.7	194	100
Another reason (ex. Pain, mobile use, nightmares, etc)	ERT	63	32.5	66	34.0	65	33.5	194	100
	Curr.	63	32.5	73	37.6	58	29.9	194	100

* Frequency *Does not respond* = 2. **Source:** Own elaboration, 2022

During the Emergency Remote Teaching period, it is observed that the response " *You cannot fall asleep in 30 minutes* " explains the sleeping problems occurring in 38% of the sample three or more times a week. In the frequency of once or twice a week, it stands out that *it feels too cold/hot* (49%), followed by *waking up in the middle of the night or early in the morning* (40.7%). Currently, the percentage majorities are only in the category once or twice a week, highlighting *Feeling too cold/hot* (45.9%), *Wake up in the middle of the night or early in the morning* (41.8%), and another reason (e.g., pain, telephone use, nightmares, etc.) with 37.6%. Applying the Student's T test confirmed that the differences between both periods are statistically significant (t= -2.15 and p=.03), finding the highest frequency of problems falling asleep during the ERT.

Changes observed after the return to regular attendance are attributed to the mandatory implementation of entry times to educational establishments, which forced students to get up at established times and, therefore, to sleep earlier. The phenomenon of sleep quality in young people during the pandemic is addressed by Ramos-Socarras et al. (2021), who established that the pandemic caused a pronounced change in adolescents toward later sleep and an increase in hours of sleep. An improvement was reported in subjective sleep quality and daytime sleepiness, that is, the ability to stay awake during the day, with results that are consistent with those of the present investigation.

3.3 Psychological dimension

3.3.1 Satisfaction with Life

Table 3. Feeling of satisfaction with life during the emergency remote teaching period and currently. N=194.

Feeling of satisfaction with life		Stongly disagree		Disagree		Slightly disagree		Not agree nor disagree		Slightly agree		Agree		Strongly agree		Total	
		Fi	%	**Fi**	%	**Fi**	%	**Fi**	%	**Fi**	%	**Fi**	%	**Fi**	%	**Fi**	%
In most ways, my life is close to my ideal.	ERT	44	22.7	41	21.1	34	17.5	36	18.6	16	8.2	17	8.8	6	3.1	194	100
	Curr.	23	11.9	26	13.5	25	13.0	36	18.7	39	20.2	29	15.0	15	7.8	193*	100
So far I have achieved the important things I want in my life	ERT	47	24.2	41	21.1	21	10.8	37	19.1	23	11.9	19	9.8	6	3.1	194	100
	Curr.	25	12.9	23	11.9	18	9.3	35	18.0	38	19.6	31	16.0	24	12.4	194	100
I am satisfied with my life	ERT	46	23.7	26	13.4	20	10.3	35	18.0	28	14.4	14	7.2	25	12.9	194	100
	Curr.	33	17.0	16	8.2	17	8.8	35	18.0	33	17.0	22	11.3	38	19.6	194	100

*Frequency *Does not respond* =1. **Source:** Own elaboration, 2022.

In general, in both periods, the percentage of majorities is concentrated in the categories ranging from Strongly disagree to slightly agree, evidencing progress in the feeling of satisfaction with life. Regarding the statement, in *most ways, my life is close to my ideal; it* is observed that, in the ERT period, the percentage majority is located in the Strongly disagree category (22.7%), while, in the Currently, it is slightly agreed (20.2%). Regarding the statement S*o far, I have achieved the essential things I want in my life*, in ERT, the majority of responses fall into the Strongly Disagree category (24.2%), while, currently, the majority fall into the category of slightly agree with 19.6%. Finally, the statement that I am satisfied with my life stands out, ranging from 46% (strongly disagree) during the ERT to 38% (strongly agree). The Student's T-test reveals significant differences, with a value of t=7.76 and a level of statistical significance of p=<0.001.

These observed changes can be explained through Erikson's Theory of Psychosocial Development, which states that the stage of adolescence is a period where the subject strives to make sense of his or her identity (Bordignon, 2005). This is configured based on achievements and challenges that he has previously experienced and, at the same time, the importance of the relationship between peers. In that sense, during emergency remote teaching, there is a lack of in-person social stimuli, which affects this process; while, currently, said development is stimulated through the interaction that the adolescent may have and the process of adaptation to the change they experienced amid the crisis after two years.

3.3.2 Positive mental well-being

Table 4. Positive mental well-being during emergency remote teaching and currently. N=194.

Positive mental wealth		Never		Rarely		Sometimes		Often		Always		Total	
		Fi	%	Fi	%	Fi	%	Fi	%	Fi	%	Fi	%
I feel positive about the future	ERT	39	20.1	46	23.7	50	25.8	44	22.7	15	7.7	194	100
	Curr.	13	6.7	32	16.5	53	27.3	61	31.4	35	18.0	194	100
I feel useful	ERT	35	18.2	61	31.8	43	22.4	25	13.0	28	14.6	192**	100
	Curr.	22	11.4	42	21.8	46	23.8	53	27.5	30	15.5	193	100
I feel relaxed	ERT	25	12.9	47	24.2	39	20.1	47	24.2	36	18.6	194	100
	Curr.	29	14.9	48	24.7	51	26.3	44	22.7	22	11.3	194	100
I have been dealing with my problems	ERT	39	20.2	50	25.9	50	25.9	33	17.1	21	10.9	193*	100
	Curr.	22	11.4	50	25.9	59	30.6	38	19.7	24	12.4	193*	100
I have been thinking clearly	ERT	29	14.9	46	23.7	48	24.7	46	23.7	25	12.9	194	100
	Curr.	12	6.2	38	19.6	55	28.4	59	30.4	30	15.5	194	100
I have been feeling close to people	ERT	54	27.8	54	27.8	35	18.0	40	20.6	11	5.7	194	100
	Curr.	9	4.5	35	18.0	40	20.6	64	33.0	46	23.7	194	100
I have been able to make my own decisions	ERT	22	11.4	35	18.1	48	24.9	41	21.2	47	24.4	193*	100
	Curr.	7	3.6	21	10.9	36	18.7	62	32.1	67	34.7	193*	100

*Frequency Does n*ot respond*= 1. **Frequency=2

Source: Own elaboration, 2022

The data obtained shows an increase in positive mental well-being compared to the period of emergency remote teaching. It is observed that most percentages move from lower categories in ERT to higher categories currently (they concentrate on the option Rarely during the ERT and Often in the current period). These changes are validated by applying the Student's T test, demonstrating significant differences between both periods (t=7.75, p=<.001).

Considering that the maximum score in the table ranges between 7 and 35 points (which represents optimal positive well-being), the average score during emergency remote teaching was 20.02 points, while currently, a slight increase is observed, reaching 23.06 points. The above allows us to infer that, although there is an increase in the positive mental well-being of the sample, it continues to be moderately low.

The above can be linked to the approach of Cohen et al. (2021), who, based on their research, point out that adolescents who were not exposed to stressful situations and who maintained a constant behavior of positive interaction with others did not have symptoms related to anxiety and depression. In that sense, the lack of interaction with peers, family, or other close people, support, and containment networks negatively impacted their mental well-being. A clear example of this is what was observed in the statement I have been feeling close to other people, where the percentage majority during the pandemic context is concentrated in the two lowest response alternatives: Never (27.8%) and Rarely (27.8%).

3.3.3 Mood and Feelings

Table 5. Moods and feelings during emergency remote teaching and currently. N=194.

Mood and feelings	ERT		Currently	
	Fi	**%**	**Fi**	**%**
Presents significant clinical depression	105	55.0	103	53.9
Does not present significant clinical depression	86	45.0	88	46.1
TOTAL	191*	100	191*	100

* Frequency *Does not respond*= 3.

Source: Own elaboration, 2022

Based on the categorization that the instrument (Short Mood and Feelings Questionnaire) allows, concerning those who present depressive traits and those who do not, the table shows that during the ERT there were 55% of adolescents presented clinically significant depression. Likewise, this reality is currently repeated with 53.9%. The Student's T-test confirms that the differences are insignificant (t= -1.44, p=.15).

It is worth mentioning that in both scenarios, there are more cases of people who have depression than those who do not suffer from it. The authors Liu & Wang (2021) propose that

depression symptoms present a combination of depressed moods, feelings of sadness, worthlessness, hopelessness, and helplessness, being one of the problems of mental health most common at this stage since they are related to social maladjustment and physical changes. In that sense, depression is linked to social and biological problems, making the biopsychosocial approach more meaningful.

3.4 Social dimension

Table 6. Social participation during emergency and current remote teaching.

Social Participation	ERT		Currently	
	Fi	**%**	**Fi**	**%**
Never	0	0.0	0	0.0
Rarely	27	14.1	8	4.2
Sometimes	113	59.2	75	39.3
Often	45	23.6	93	48.7
Always	6	3.1	15	7.9
TOTAL	191	100	191	100

* Frequency D*oes not respond*= 3.

Source: Own elaboration, 2022

In both periods, it is possible to observe that everyone had some social interaction since the option never received a response. During the pandemic, the category sometimes represented the majority with 59.2%, while currently, the category often led the options with 48.7%. During the ERT, the average participation was 27.09 points, which, according to the total scale of the variable, corresponds to the category in which I sometimes participate socially. In contrast, the average is currently located in the category I often participate in socially (31.48 pts.), evidencing increased participant interaction. Through the Student T test, it is possible to confirm that these differences are significant (t=11.87, p=<.001).

The biopsychosocial model based on the General Systems Theory (Al-Sabbah et al., 2021) suggests that open systems constantly exchange elements with their environment. Under this statement, the results obtained in this research allow us to infer that due to the pandemic, these exchanges were weakened due to health measures. This theory indicates that social phenomena must be considered in terms of systems; in this sense, the increase in social participation today is related to this approach since, when these health restrictions were lifted, the flow of elements between systems resumed. Its pace prior to the pandemic.

The results would generally confirm what Prilleltensky et al. (2001) reported, which states that integration into community life and participation in social activities actively increases psychological and social well-being.

3.5 Differences according to sex in aspects that demonstrated greater variation

To respond to the last objective, bivariate analyses are carried out between the sex variable and physical activity, positive mental well-being, and social participation.

Table 7. Physical activity by sex during emergency remote teaching and currently.

	Physical Activity									
Gender	**During ERT**					**Currently**				
	Media	N	DS	Test	P	Media	N	DS	Test	P
Male	2.27	86	1.93	t=1.73	.08	3.78	86	2.10	t= 3.80	.001
Female	1.80	95	1.68			2.62	95	1.99		
Total		181*					181*			

*Frquency *Does not respond*= 13.

Source: Own elaboration, 2022

After applying the T Student statistical test, it is recognized that during emergency remote teaching, the variable "physical activity" does not present significant differences according to sex (t=1.73; p=.08), while, currently, it allows us to infer that differences are observed; showing that it is men who perform more physical activity than women. (t=3.80; p= .001). These results can be contrasted with the findings of the National Survey of Physical Activity and Sports Habits by the Ministry of Sports in 2021. In this study, it is observed that, from a sample of 884 people, women between 11 and 17 years old present a higher level of inactivity than men of that age (84.9% and 71.8% respectively) (Ministerio del Deporte de Chile [MINDEP], 2021).

According to the results obtained in the survey by the Ministry of Sports and in this investigation, it is evident that women's activity levels are lower than men's. If the above is analyzed from a systemic perspective, it could be related to the difference observed in the other dimensions studied (such as the following), where women score with reduced percentages to their male peers.

Table 8. Positive mental well-being by sex during emergency remote teaching and currently

	Positive Mental Well-being									
Gender	**During ERT**					**Currently**				
	Media	**N**	**DS**	**Test**	**P**	**Media**	**N**	**DS**	**Test**	**P**
Male	21.29	85	7.03	t=1.94	.05	24.31	86	5.82	t=2.46	.01
Female	19.42	95	5.89			22.27	95	5.30		
Total		180*					181			

*Frequency *Does not respond* =14 **Frequency *Does not respond* =13

Source: Own elaboration, 2022

When applying the Student's T test, in both periods, the differences are significant according to sex, increasing, which allows us to infer that men present greater positive mental well-being than women. According to Kuehner (2017), this would be related to the greater susceptibility of women to the activating effects of sexual hormones during the pubertal transition since the biopsychosocial perspective is again presented as necessary.

Table 9. Social participation by sex during emergency remote teaching and currently.

Gender	**Social Participation**									
	During ERT					Currently				
	Media	N	DS	Test	P	Media	N	DS	Test	P
Male	27.00	86	6.84	t=-0.30	.76	32.02	85	6.53	t=0.84	.39
Female	27.29	94	6.28			31.25	95	5.69		
Total		180					180			

Source: Own elaboration, 2022

Regarding social participation, women had a slightly higher average during the ERT than men. By applying the statistical test, it is possible to conclude that, in both periods, the differences by sex are not statistically significant. (ERT t= -0.30 p=.76 and recency t=0.84 p=.39). The above confirms that adolescents are less motivated after confinement to carry out activities they usually enjoy, such as interacting with friends. This demotivation can be linked to health restrictions, which were otherwise unrelated to their sex (United et al.'s Fund [UNICEF], 2022).

In general, these results allow Engel's view to be valued through the biopsychosocial model (Engel, 1977, cited in Al-Sabbah et al., 2021) since it is possible to observe how, based on a context (in this case, teaching remote emergency) changes are recognized in various aspects of the life of a group of adolescents; thereby validating the idea from which this research emanates, which corresponds to the importance of observing problems, changes, and social phenomena, with a holistic perspective, and understanding that people inhabit a series of dimensions. Therefore, they must consider these factors when conducting social research.

4. Conclusions

Answering the central question: What are the main changes in the three dimensions of adolescents' lives after emergency remote teaching? The variables *physical activity, positive mental well-being, and social participation s*how more significant variation between periods. It is observed that the three variables increased; that is, currently, adolescents are doing more physical activity, have greater positive mental well-being, and participate socially more actively.

The proposed research hypothesis establishes that male students have better total scores than women in positive mental well-being. In this regard, it is possible to accept the hypothesis since significant differences were observed between men and women in both periods, with the former obtaining higher scores.

In the biological dimension, it is observed that the intake of unhealthy foods decreases, but the tendency to eat many foods without control remains. Regarding alcohol consumption, in both periods, adolescents do not follow this type of behavior, although the category decreases, which would indicate an increase in alcohol consumption associated with the availability.

Regarding sleep quality, a decrease is seen in the later hours of going to bed and a slight increase in both the consumption of sleeping medications and difficulties falling asleep.

In the psychological dimension, just as positive mental well-being increases, so does the feeling of satisfaction with life; that is, adolescents demonstrate greater conformity with their own lives after the period of emergency remote teaching. A worrying result is revealed through the variable moods and feelings since although a decrease is currently observed in those adolescents who present clinically significant depression, the figures continue to be very high.

The study of the social dimension through participation allows us to deduce that it increases after emergency remote teaching.

Considering these results and the dynamism of reality, it becomes relevant for Social Work to maintain the vision of the biopsychosocial model, which is why it is impossible to address the observed changes piecemeal. Based on the high rates of depression detected, the position must aim at actions that impact the three dimensions, not only the psychological one, understanding that the human being is composed in a biopsychosocial way and that these dimensions are in constant interaction. Community-based interventions are then suggested, which involve the bond of adolescents with their peers and other people in their educational and territorial community who function as protective factors. Likewise, it encourages physical, psychological, and social self-care, promoting healthy lifestyles.

This crisis and the changes observed allow us to recognize and incorporate learning for the discipline and profession in future critical moments, contributing to the area of intervention in disaster situations. Therefore, it is necessary to emphasize that if the context involves implementing emergency measures, these cannot focus on a single aspect of the problem but rather.

It requires the joint work of the government, ministries, and institutions to ensure they respond to a crisis with a systemic view. For example, in the case of the pandemic, the measures they should not only focus on eliminating the virus but also be linked to ensuring services to support the comprehensive well-being of people, which implies multidisciplinary work to address different problems holistically and comprehensively. The time slots for outdoor exercise and the times established so that older people could do their shopping are recognized as positive measures.

From Social work, the contribution must also be placed in the recognition and understanding of diversity and inequality amid the crisis, and with this, demonstrate the presence of various types of vulnerability that people face, whether due to circumstances social, economic, physical, or psychological; resulting in each individual, group, and community being affected in different ways. This makes sense in this study, which addresses a vulnerable stage of life since it is full of changes and crises, as it requires analysis, understanding, and intervention.

It is necessary to create public policies with a multidimensional perspective that collaborate to mitigate the negative impact on all artists that the pandemic and emergency remote teaching have had on society, especially on groups primarily affected, like boys, girls, and adolescents. In that sense, it is essential to strengthen the role of Social Work in strategic functions and spaces to plan and execute programs and projects that would arise from government work, such as in educational facilities or health centers. Incorporating social workers into the Chilean Health Code is a clear example of that, an area in which our discipline would highlight the value that the different aspects of human development have in health (the biochemical, the psychological, and the social).

Regarding the limitations of the research, it is essential to consider the type of sample, which could be probabilistic and include cohorts from different educational establishments, for example. Likewise, the type of study, considering a longitudinal, quasi-experimental one with a correlational or causal design, adds other variables that allow regression analysis to obtain complete knowledge about which aspects have the most significant impact on these observed changes.

Based on the above, as a suggestion for future research, it is proposed to carry out new analyses such as, for example, establishing relationships between the variables where more significant variation is observed. The age group is proposed to be extended to primary education students and those who attend secondary education at the Centers for Integrated Adult Education (CEIA) to contrast the results obtained with the age variable. Also, it is recommended that the research problem be addressed with students from subsidized and private institutions, who can allow us to differentiate possible changes based on the place of origin. To deepen the analysis regarding sex differences, it is suggested that gender-related theories that contribute to the theoretical discussion be included and allow for new conclusions.

Finally, it is suggested to investigate possible changes in students at a regional and national level, with longitudinal approaches that allow a broad vision of this topic and generate new lines of work and specific strategic axes to address the problems observed with multi-sector social policies and contribute in an integral way to the solutions.

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Gonzalo Sánchez-Uribe: conceptualization, data curation, formal analysis, resource acquisition, research, methodology, writing (original draft), writing (review of the draft and revision/correction); Génesis Jaramillo-Arce: conceptualization, research, methodology, writing (original draft), writing (review of the draft and revision/correction); Claudia Quiroga-Sanzana: conceptualization, data curation, formal analysis, resource acquisition, research, methodology, supervision, writing validation (original draft), writing (review of the draft and revision/correction).

Conflicts of interest

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