

ORIGINAL

Diet quality and job satisfaction in Chilean workers: Mediating role of food-related life and family satisfaction

Javiera Rodríguez^a , Ligia Orellana^{b,c} , Catalina Abarzúa^d , Berta Schnettler^{c,e,f,g,*} 

^a Departamento de Ingeniería Industrial y de Sistemas, Universidad de La Frontera, Temuco, Chile

^b Departamento de Psicología, Universidad de La Frontera, Temuco, Chile

^c Centro de Excelencia en Psicología Económica y del Consumo, Universidad de La Frontera, Temuco, Chile

^d Escuela de Pedagogía, Facultad de Educación, Ciencias Sociales y Humanidades, Universidad de La Frontera, Temuco, Chile

^e Facultad de Ciencias Agropecuarias y Medioambiente, Universidad de La Frontera, Temuco, Chile

^f Scientific and Technological Bioresource Nucleus (BIOREN-UFRO), Universidad de La Frontera, Temuco, Chile

^g Universidad Católica de Santiago de Guayaquil, Guayaquil, Ecuador

Received 6 December 2024; accepted 23 April 2025

Abstract

Introduction: Work significantly impacts life satisfaction. Identifying factors that boost job satisfaction is important for workers, their families, and the workplace. This study examined the serial mediating role of satisfaction with food as well as family satisfaction in the relationship between diet quality and job satisfaction among workers. **Method:** An online questionnaire was applied to 215 women and 215 men with paid employment in the Santiago Metropolitan Region of Chile, which included the Adapted Healthy Eating Index, the Job Satisfaction Scale, the Food Satisfaction Scale, and the Family Satisfaction Scale. The statistical analysis considered a serial mediation model with a 95% Confidence Interval. **Results:** No significant direct relationship was found between diet quality and job satisfaction. Diet quality showed a direct and positive relationship with food-related life satisfaction, which played a significant mediating role in the relationship between diet quality and job satisfaction. Family satisfaction was not significantly related to diet quality, nor did it mediate this relationship, although it was significantly associated with food-related life satisfaction. Diet quality and job satisfaction were indirectly linked through satisfaction with food-related life and family, which played a significant role in mediating this relationship. **Conclusion:** Satisfaction with food played a significant mediating role in the relationship between diet quality and job satisfaction. Although family satisfaction did not have a direct mediating role, it is suggested that policies be implemented to improve diet quality and support workers' families, thereby increasing job satisfaction.

Keywords: Diet quality, satisfaction with food-related life, satisfaction with family, job satisfaction, serial mediation.

© 2025 Fundación Universitaria Konrad Lorenz. This is an open access article under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

* Corresponding author.
E-mail: berta.schnettler@ufrontera.cl

<https://doi.org/10.14349/sumapsi.2025.v32.n1.2>

ISSN 0121-4381, ISSN-E 2145-9797/© 2025 Fundación Universitaria Konrad Lorenz. This is an open access article under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Calidad de la dieta y satisfacción laboral en trabajadores chilenos: rol mediador de la satisfacción con la alimentación y con la familia

Resumen

Introducción: El trabajo tiene un impacto significativo en la satisfacción vital. Identificar los factores que impulsan la satisfacción laboral es importante para los trabajadores, sus familias y el entorno laboral. Este artículo examinó el rol mediador en serie de la satisfacción con la alimentación y la satisfacción con la familia en la relación entre la calidad de la dieta y la satisfacción laboral de trabajadores. **Método:** Se aplicó un cuestionario en línea a 215 mujeres y 215 hombres con trabajo remunerado en la Región Metropolitana, Chile, que incluyó el Índice de Alimentación Saludable Adaptado, la Escala de Satisfacción Laboral, la Escala de Satisfacción con la Alimentación y la Escala de Satisfacción Familiar. El análisis estadístico consideró un modelo de mediación en serie con un Intervalo de Confianza del 95 %. **Resultados:** La relación directa entre la calidad de la dieta y la satisfacción laboral no fue significativa. La calidad de la dieta presentó una relación directa y positiva con la satisfacción con la alimentación, la cual cumplió un rol mediador significativo en la relación entre la calidad de la dieta y la satisfacción laboral. La satisfacción con la familia no mostró una relación significativa con la calidad de la dieta ni un rol mediador en esta relación, aunque sí se asoció significativamente con la satisfacción con la alimentación. La calidad de la dieta y la satisfacción laboral se asociaron indirectamente mediante la satisfacción con la alimentación y con la familia, que cumplieron un rol mediador en serie significativo en esta relación. **Conclusión:** La satisfacción con la alimentación cumplió un rol mediador significativo en la relación entre la calidad de la dieta y la satisfacción laboral. Aunque la satisfacción con la familia no tuvo un rol mediador directo, se sugiere implementar políticas para mejorar la calidad de la dieta y apoyar a la familia de los trabajadores para aumentar la satisfacción laboral.

Palabras clave: Calidad de la dieta, satisfacción con la alimentación, satisfacción con la familia, satisfacción laboral, mediación en serie.

© 2025 Fundación Universitaria Konrad Lorenz. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

The subjective perception of quality of life is represented in the concept of subjective well-being (SWB), which refers to individuals' evaluations of their own lives and encompasses happiness, pleasurable emotions, life satisfaction, and the relative absence of emotional states of displeasure (Adler et al., 2023). Within SWB, the cognitive component corresponds to life satisfaction, which can be assessed globally or by specific domains (Veenhoven et al., 2021). One of the explanatory models of life satisfaction is the bottom-up model (Diener et al., 1999). This model suggests that overall life satisfaction is influenced by satisfaction in various domains, such as family, work, health, and financial situation (Pavot et al., 2008). According to this approach, the most immediate and important domains in people's lives greatly influence overall life satisfaction (Chmiel et al., 2012). Therefore, people are satisfied with their lives because they experience satisfying situations or moments in different domains that they consider meaningful (Diener et al., 1999).

Work is one of the most relevant domains for life satisfaction because it is one of everyday life's most time- and energy-consuming activities. Job satisfaction can have positive and negative effects on individuals, resulting in stress or high levels of satisfaction (Edralin & Rosario, 2013). Identifying variables that increase job satisfaction is crucial for workers, their families, and the workplace (Chan et al., 2020). In the Chilean context, studies have highlighted how working conditions and fears related to COVID-19 influenced life satisfaction

among professionals, emphasising the need to consider both structural and psychological aspects in labour settings (Denegri et al., 2021).

In this context, several national and international studies have assessed the impact of structural job factors, such as available lunch time and work schedules, on workers' diets (Paredes et al., 2018; Salinas et al., 2014). As workplace well-being gains increasing recognition, researchers have begun to explore how job structure influences workers' health habits, particularly nutrition. Given the increasing recognition of workplace well-being, researchers have examined how job structure impacts workers' health behaviours, including diet. These studies have identified certain groups of workers who experience structurally precarious nutrition, highlighting that many workers do not have access to a proper diet during their workday, which can have detrimental effects on their health.

Previous research suggests that a healthy diet not only improves physical health but is also associated with psychological benefits, such as enhanced mood and higher energy levels. These factors, in turn, contribute to better job performance and greater job satisfaction (Conner et al., 2015). In line with this, several authors have emphasised the crucial role of a healthy diet in promoting job satisfaction (Penttinen et al., 2021; Xu et al., 2019). Furthermore, healthy food consumption has been linked to lower job stress (Alexandrova-Karmanova et al., 2016; Chui et al., 2019; Penttinen et al.,

2021) and increased work commitment, both of which are associated with higher job satisfaction.

In addition to the relationship between diet quality and job satisfaction, research with dual-income families has found an association between satisfaction with food-related aspects of life and diet quality, which encompasses aspects such as variety, balance, and the nutritional value of the food consumed (e.g., Schnettler et al., 2022). Satisfaction with food-related life is defined as people's positive perception of their diet and eating habits (Grunert et al., 2007). This relationship suggests that greater satisfaction with food-related life is linked to healthier and more conscious food choices, which aligns with theoretical models in the psychology of eating, such as the Theory of Planned Behaviour (Ajzen, 1985), which posits that positive attitudes towards food are key predictors of healthy eating behaviours.

Family is one of the main institutions for human development and constitutes one of the pillars upon which personal and social well-being is based (Matei et al., 2021). According to Zabriskie and Ward (2013), satisfaction with family is defined as an individual's overall assessment of the circumstances of their family life compared to their own standards and expectations. One aspect of family life that can influence well-being is the quality of the diet, as family eating habits have been linked to better nutrition and overall satisfaction. During the pandemic, studies reported that a higher frequency of family meals is associated with better diet quality (Berge et al., 2016; Grunert et al., 2021), as well as higher consumption of home-made food (Grunert et al., 2023; Ruiz-Roso et al., 2020; Wang et al., 2021). Furthermore, the determinants of job satisfaction are linked not only to work but also to family influences since family obligations might disrupt an individual's work responsibilities (Venkatesh et al., 2019), while family resources may positively affect the work environment (Kalliath et al., 2019). Recent studies in Chile highlight the complex interaction between work–family conflict, support, and family satisfaction, showing that higher levels of work support can mitigate the negative impact of work–family conflict on family well-being (Neculman et al., 2025).

In addition to the bottom-up approach to life satisfaction, the spillover model proposes a positive relationship between life domains and life satisfaction (Strauser, 2013). However, according to Sirgy (2012), individual experiences in one life domain not only influence life satisfaction (vertical indirect effect), but can also interact with each other, such as work, finance, family, and fun (horizontal indirect effect). This framework suggests that the relationship between diet quality and job satisfaction might not be direct, but instead mediated by satisfaction in other life domains, such as family life and satisfaction with food-related aspects of life, highlighting the need for a mediation model to better understand these interactions. In this regard, Hun et al. (2022) suggest that the effect of a healthy diet on job satisfaction is not direct but may be influenced by well-being in other areas of an individual's life. The serial mediators have been established based on their conceptual and empirical proximity to the independ-

ent and dependent variables. Satisfaction with food-related life was proposed as the first mediating variable because it measures people's perception of their diet and eating habits (Grunert et al., 2007), which is likely linked to another food-related variable, diet quality. On the other hand, satisfaction with family has shown significant correlations with job satisfaction (Schnettler, Miranda-Zapata et al., 2020). This link has been explained by considering the interrelations between the job and family domains (Greenhaus & Powell, 2006). On this basis, it is proposed that satisfaction with one's eating habits can be carried over to family members (e.g., by sharing meals), and this can contribute to improving the individual's family relationships.

Therefore, this study examined the serial mediating role of satisfaction with food-related life and satisfaction with family in the relationship between diet quality and job satisfaction in Chilean workers. The following hypotheses are proposed:

H1: Diet quality is directly and positively associated with job satisfaction.

H2: Satisfaction with food-related life plays a mediating role between diet quality and job satisfaction.

H3: Satisfaction with family plays a mediating role between diet quality and job satisfaction.

H4: Satisfaction with food-related life and satisfaction with family have a serial mediating role between diet quality and job satisfaction.

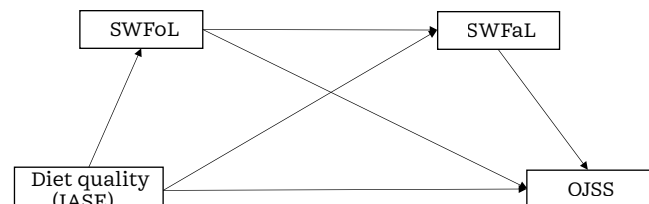


Figure 1. Proposed serial mediation model for Satisfaction with food-related life (SWFoL), Satisfaction with family (SWFaL), diet quality (measured by IASE or Adapted Healthy Eating Index, IASE in Spanish), and Job satisfaction (OJSS)

Understanding indirect relationships is critical to developing effective interventions promoting job satisfaction and worker productivity. The relationship between job satisfaction and worker productivity is a widely researched topic in the literature, as higher well-being at work has been associated with improved performance, reduced absenteeism, and lower job turnover (Ensour & Al Maaaitah, 2024). In this context, the present study is relevant in exploring the relationship between diet quality and job satisfaction and how other aspects of workers' lives, such as satisfaction with food-related life and family, may mediate this relationship. This model suggests that overall life satisfaction is influenced by satisfaction in different domains, such as family, work, health, and financial situation (Pavot et al., 2008). Recent longitudinal studies in Chile have shown that self-rated health and life satisfaction are closely related to psychological well-being, particularly concerning depressive symptoms (Schleef et al., 2024).

Method

The methodological design is quantitative, non-experimental, cross-sectional, descriptive, and correlational (Carrillo et al., 2023; Moysén & Villaveces, 2023).

Participants

The inclusion criteria were residing in the commune of Santiago or its surrounding areas in the Santiago Metropolitan Region of Chile, belonging to nuclear families with two parental incomes, and having adolescent children between 10 and 15 years of age. The sample was purposively selected through quota sampling, proportional to the communal distribution of families by socioeconomic level (SEL), categorised as high, medium, and low, based on the 2015 CASEN survey (Ministerio de Desarrollo Social, 2016).

430 participants completed the questionnaire, comprising 50% men and 50% women; with an average age of 41.1 years. Most belong to the middle SEL, 72.6% have a dependent job, 65.8% work full-time, and 84.4% perform their duties in person (Table 1).

Table 1. Socio-demographic description of the sample (%)

Characteristics	Total sample
Age	
20 - 30 years	47.2
40 - 50 years	51.3
60 - 70 years	1.1
Socioeconomic level	
Low	19.1
Medium	80.2
High	0.7
Type of work	
Dependent	72.6
Independent	27.4
Workday	
Full-time	65.8
Part-time / Shifts	34.2
Form of work	
In-person	84.4
Remote	15.6

Instruments

For data collection, the study participants answered a questionnaire with socio-demographic identification questions: age, kind of employment, working day, and form of work. Questions about household size and income were also asked to determine socioeconomic status (Asociación de Investigadores de Mercado, 2016). In addition, the following scales and instruments were included:

Adapted Healthy Eating Index (IASE in Spanish).

The IASE, adapted from the US-HEI (Kennedy et al., 1995) by Norte and Ortiz (2011), assesses overall dietary quality in Spanish-speaking populations. It considers the frequency of consumption of nine food groups: ce-

reals, vegetables, fruits, dairy products, meats, legumes, processed meats, sweets, and sugary soft drinks. Participants indicated their consumption frequency on a five-point scale, ranging from 'daily' to 'never'. Each group is scored from 0 to 10 according to compliance with dietary recommendations, and a score is added for dietary variety, with a maximum of 100 total points. Scores above 80 indicate a healthy diet, between 51 and 80 suggest that changes are required, and below 50 indicate an unhealthy diet.

Overall Job Satisfaction Scale (OJSS). Proposed by Agho et al. (1992), it consists of 6 items grouped into one dimension that assess the worker's overall satisfaction with their job. An example item is "I enjoy my work very much". Respondents indicated their degree of agreement with each statement using a 5-point Likert scale (1: "completely disagree", 5: "completely agree"). The Spanish version of the OJSS, previously validated in studies in Chile (Schnettler, Miranda-Zapata et al., 2020), was used and showed good internal consistency in the study sample (Cronbach's $\alpha = 0.895$, $\omega = 0.900$). OJSS scores are derived from the aggregate of the scores of the six items. Higher scores indicate greater job satisfaction.

Satisfaction with Food-related Life Scale (SWFoL). Proposed by Grunert et al. (2007), it assesses a person's overall satisfaction with their eating habits. It has a single dimension that groups the five items of the scale. For example, "Food and meals are very positive elements in my life". The respondent was asked to answer their level of agreement with each of these statements on a 6-point Likert scale (1: strongly disagree, 6: strongly agree). The version validated in Chile has α values > 0.76 in adults (Schnettler, Miranda-Zapata et al., 2020) and showed good internal consistency in this study sample (Cronbach's $\alpha = 0.827$, McDonald's $\omega = 0.834$). The SWFoL score is the sum of the five items on the scale. Higher scores indicate greater SWFoL.

Satisfaction with Family Life Scale (SWFaL). Proposed by Zabriskie and McCormick (2003), it is a modified version of the Satisfaction with Life Scale (SWLS, Diener et al., 1985) in which the words 'family life' replaced the word 'life' in each of the five original items of the SWLS. The SWFaL scale corresponds to a conscious cognitive judgment of family life in which the judgment criteria depend on the individual (Zabriskie & Ward, 2013). An example of the items of this instrument is: "In many ways, my family life is close to ideal". This study used the Chilean-validated version of the SWFaL scale, which has shown good internal consistency in studies with adults ($\alpha > 0.91$) in Chile (Schnettler, Miranda-Zapata et al., 2020). Respondents were asked to indicate their degree of agreement with the five statements using a six-point Likert scale (1: completely disagree, 6: completely agree). The SWFaL score is the sum of the five items on the scale. Higher scores indicate greater satisfaction with family. The scale showed good internal consistency in this study sample (Cronbach's $\alpha = 0.908$, $\omega = 0.940$).

The discriminant validity of the SWFoL, SWFaL, and OJSS scales has previously been demonstrated in samples of workers in Chile through confirmatory factor analysis (Schnettler, Miranda et al., 2020). In their anal-

ysis, Schnettler, Miranda-Zapata et al. (2020) reported that the measurement models for OJJS (RMSEA = 0.039; CFI = 0.989; TLI = 0.984), SWFaL (RMSEA = 0.070; CFI = 0.984; TLI = 0.976), and SWFoL (RMSEA = 0.051; CFI = 0.987; TLI = 0.979) showed good or at least acceptable fit to the data. Furthermore, all three scales demonstrated strong reliability, with Omega coefficients ranging from 0.89 to 0.99 and average extracted variance values exceeding 0.50. The factor loadings also supported convergent validity, as all were statistically significant and had values above 0.5.

Procedure

Data were collected between March and July 2021, following a protocol approved by the Ethics Committee of the Universidad de La Frontera. The university adheres to the Declaration of Helsinki, ensuring that the study complies with internationally recognized ethical standards for research involving human participants. To select participants, authorities from schools in Santiago and surrounding communes were contacted. The Vulnerability by School Benchmark Index (IVE in Spanish) was used to represent the socioeconomic distribution of households. Parents were invited to participate, and trained interviewers informed them about the objectives and characteristics of the study, ensuring the confidentiality and anonymity of their responses. Data were collected online through QuestionPro and supervised by interviewers who kept in contact via telephone and email. Participants provided informed consent online before answering the questionnaires, where the ethical measures taken to safeguard data integrity and privacy were detailed. Each participant was identified with a number for subsequent data analysis.

As a token of appreciation for their contribution to the study, participants were given an electronic transfer of \$10,000 Chilean pesos.

Data analysis

The analyses were carried out using the statistical programme IBM SPSS v. 20.0 as well as the PROCESS macro v. 3.4. To examine the reliability of the scales used, Cronbach's alpha and Omega coefficient analyses were performed, which must exceed the criterion of $\alpha \geq 0.7$ established for research purposes (Carretero-Dios & Pérez, 2005). The correlations among the variables under study were calculated using Pearson's correlation analysis.

A serial mediation path analysis (Figure 1) was employed to achieve the study's objectives, utilising Hayes' (2018) Model No. 6.

The IASE (diet quality) was considered an independent variable, job satisfaction a dependent variable, and satisfaction with food-related life and satisfaction with family as mediators (Figure 1). Gender, socioeconomic status, and type of work were used as control variables. The statistical criterion $p < 0.05$ was used to reject the null hypotheses. The 95% confidence interval with values containing 0 was the statistical requirement for mediation to reject the null hypotheses (Erceg-Hurn & Mirosevich, 2008).

Results

Table 2 presents the mean scores and correlations among the studied variables. All identified associations demonstrated statistical significance and followed the expected patterns. Considering the average values, the participants are satisfied with their work, food, and family (Table 2). Regarding the IASE, the average value indicates that the diet requires change (Kennedy et al., 1995).

To answer the specific objectives, a serial mediation analysis was conducted using Hayes' (2018) Model No. 6. Regarding the independent and dependent variables (Figure 2), the findings showed that there is no significant correlation between job satisfaction and diet quality ($c' = -0.002$; $p = 0.904$); therefore, hypothesis 1 is rejected. Diet quality was positively and significantly associated with satisfaction with food-related life ($a_1 = 0.115$; $p < 0.001$). Satisfaction with food-related life was also positively and significantly associated with job satisfaction ($b_1 = 0.244$; $p < 0.001$). There was no significant correlation between satisfaction with family and diet quality ($a_2 = 0.026$; $p = 0.149$). Satisfaction with family was positively and significantly related to job satisfaction ($b_2 = 0.134$; $p < 0.01$). Satisfaction with food-related life was positively and significantly associated with satisfaction with family ($d_1 = 0.283$; $p < 0.001$).

The mediation results demonstrate that satisfaction with food-related life mediates the connection between diet quality and job satisfaction ($a_1 b_1 = 0.080$), as indicated by the 95% CI, which does not contain zero [0.039; 0.129]. These results support the acceptance of hypothesis 2.

In contrast, satisfaction with family did not play a statistically significant mediating role in the relationship between diet quality and job satisfaction (a_2

Table 2. Mean, standard deviation, and correlations between variables

	Mean (SD)	1	2	3	4
1. Diet quality (IASE)	62.11 (13,57)	--			
2. Job satisfaction	22.05 (4,71)	0.125**	--		
3. Satisfaction with food-related life	22.07 (7,65)	0.295**	0.275**	--	
4. Family satisfaction	23.74 (4,85)	0.148**	0.209**	0.301**	--

** The correlation is significant at 0.001 (bilateral).

$b_2 = 0.009$), as indicated by the 95% CI containing zero $[-0.005; 0.027]$. Hence, hypothesis 2 is rejected.

In serial mediation, satisfaction with food-related life and family positively mediate the association between diet quality and job satisfaction among this sample of workers ($a_1 d_1 b_1 = 0.012$, 95% CI $[0.025; 0.029]$). These results support the acceptance of hypothesis 4. The total indirect effect was significant ($c - c' = 0.103$, 95% CI $[0.056; 0.158]$).

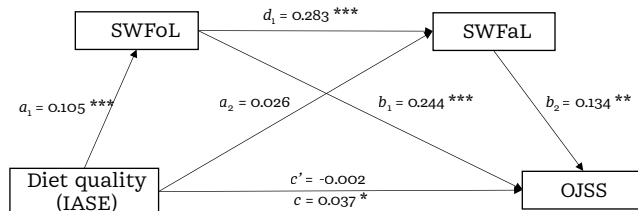


Figure 2. Results of serial mediation between for Satisfaction with food-related life (SWFoL), Satisfaction with family (SWFaL), diet quality (measured by IASE or Adapted Healthy Eating Index, IASE in Spanish), and Job satisfaction (OJSS)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Furthermore, indirect effects and effect contrasts are displayed in Table 3, including β and SE values. The confidence intervals, which do not contain zero, indicate that the total indirect effect is significant ($\beta = .0359$, CI = $.0196-.0584$), as well as the effect with the model that includes SWFoL as a mediator (Ind1, $\beta = .0283$, CI = $.0138-.0452$) and the effect for the model with both SWFoL and SWFaL (Ind3, $\beta = .0044$, CI = $.0008-.0099$) as serial mediators. Regarding contrasts between models, the difference between Ind1 – Ind2 ($\beta = .0250$, CI = $.0089-.0432$) and Ind1 – Ind3 ($\beta = .0241$, CI = $.0085-.0414$) show that Ind1 is statistically different from the other two, whereas Ind2 and Ind3 are statistically similar ($\beta = -.0009$, CI = $-.0090-.0050$). These findings support that the IASE-SWFoL-OJSS model is significantly larger than IASE-SWFaL-OJSS and IASE-SWFoL-SWFaL-OJSS.

Regarding the control variables, gender significantly influenced the relationship between diet quality and satisfaction with food-related life (0.161 ; $p < 0.001$), while the SEL significantly affected the relationship between diet quality and satisfaction with family (0.112 ; $p = 0.015$).

The percentage of variance explained by this model is 28.8%; the model was statistically significant ($p < 0.001$).

Discussion

The present study is the first to examine the serial mediating role of satisfaction with food-related life and satisfaction with family in the relationship between diet quality and job satisfaction. The results showed no direct significant relationship between diet quality and job satisfaction, contradicting previous studies that have positively associated healthy eating with job satisfaction (Penttinen et al., 2021; Xu et al., 2019). However, our results align with Hun et al. (2022)'s suggestion that the impact of a nutritious diet on job satisfaction is not direct; it may be influenced by an individual's overall well-being in various aspects of their life. Thus, the lack of a direct relationship in the present study may be attributed to the presence of satisfaction with food-related life and satisfaction with family as mediators. The correlations between job satisfaction and satisfaction with food-related life and between job satisfaction and satisfaction with family were stronger than the correlation between job satisfaction and diet quality (see Table 2). In addition, another plausible explanation of our results is that they may be related to the specific context of Chilean workers, including cultural and workplace differences, which may differ from the settings of studies that found significant direct associations.

Diet quality was positively associated with satisfaction with food-related life, which is consistent with previous research that has linked better diet quality with higher levels of satisfaction with food-related life (Schnettler et al., 2020; 2023). In addition, satisfaction with food-related life showed a positive relationship with job satisfaction, consistent with previous evidence linking the two factors (Schnettler, Miranda-Zapata et al., 2020; Zhang & Ma, 2020). Satisfaction with food-related life significantly mediated between diet quality and job satisfaction, suggesting that a better diet enhances satisfaction with food-related life, which in turn influences job satisfaction. This finding is consistent with studies that point to a relationship between job satisfaction and well-being beyond the work setting, including health and healthy food consumption (Chan et al., 2020; Paredes et al., 2018; Penttinen et al., 2021; Sali-

Table 3. Indirect and model contrast effects for Diet quality and Job satisfaction

Outcomes	β	BootSE	BootLLCI	BootULCI
Total indirect effect				
Diet quality – job satisfaction	.0359	.0090	.0196	.0584
Indirect effect				
AHEI-SWFoL-SJob (Ind1)	.0283	.0080	.0138	.0452
AHEI-SWFaL-SJob (Ind2)	.0032	.0028	-.0019	.0093
AHEI-SWFoL-SWFaL-SJob (Ind3)	.0044	.0023	.0008	.0099
Contrast Ind1 – Ind2	.0250	.0087	.0089	.0432
Contrast Ind1 – Ind3	.0241	.0083	.0085	.0414
Contrast Ind2 – Ind3	-.0009	.0035	-.0090	.0050

nas et al., 2014; Xu et al., 2019). In other words, a higher quality of diet is linked to job satisfaction through an individual's satisfaction with food-related life. This finding implies that what workers eat fuels their bodies and indirectly boosts their happiness and fulfilment at work.

By contrast, there was no significant relationship between diet quality and satisfaction with family, nor was there a mediating role of satisfaction with family in the relationship between diet quality and job satisfaction. In this context, the findings of this study indicate that, for the sample analysed, the quality of diet did not emerge as a significant determinant of satisfaction within the family domain. This result can be attributed to the observation that, for employees, satisfaction with family is more closely associated with social interactions during family meals than with the nutritional quality of the food itself (Berge et al., 2016; Jones, 2018; Riquelme & Giacoman, 2018; Utter et al., 2018). However, a positive relationship was observed between satisfaction with family and job satisfaction, consistent with prior research on couples with a dual parental income (Orellana et al., 2023).

Similarly, satisfaction with family was positively related to satisfaction with food-related life. Previous studies have shown that the social context of food consumption influences well-being and satisfaction with food-related life (Conner et al., 2017; Otake & Kato, 2017; Warner et al., 2017), particularly when food is enjoyed in the company of familiar individuals (Nepper et al., 2016). Therefore, the positive associations between diet quality and satisfaction with food-related life, satisfaction with food-related life and satisfaction with family, and satisfaction with family and job satisfaction suggest an underlying mechanism that explains the relationship between diet quality and job satisfaction. Namely, satisfaction with food-related life and satisfaction with family life were significant serial mediators between diet quality and job satisfaction. These results suggest that, although diet quality and job satisfaction have no direct relationship, they are indirectly linked through these satisfaction domains. These results are consistent with the cross-domain spillover theory (Sirgy, 2012) and provide a deeper understanding of the relationship between diet quality and job satisfaction among Chilean workers. These results suggest that an adequate diet quality is a crucial factor for workers, as it not only directly enhances their satisfaction with food-related life but also indirectly improves their satisfaction in the family and work domains. This is a relevant result because diet quality also has the potential to indirectly positively influence life satisfaction according to the bottom-up model (Diener et al., 1999).

The data indicate a stronger relationship between diet quality, satisfaction with food-related life, and job satisfaction than between diet quality, family satisfaction, and job satisfaction. This suggests that while family satisfaction may play a role, it is not essential to understanding the relationship between diet quality and job satisfaction. Therefore, the model that includes diet quality, satisfaction with food-related life, and job satisfaction is more effective in explaining the connection

between diet quality and job satisfaction compared to the model that considers satisfaction with food-related life and family satisfaction as sequential mediators.

Regarding the control variables, the influence of gender in the relationship between diet quality and satisfaction with food-related life may be associated with the different conceptualisation that women and men have regarding satisfaction with food-related life. While women associate satisfaction with food-related life with healthy eating, men associate satisfaction with food-related life with both healthy and tasty but unhealthy foods (Schnettler, Hueche et al., 2020). The influence of the SEL on the relationship between diet quality and satisfaction with family may be associated with evidence showing that individuals from families with a low SEL have more unhealthy eating habits than their counterparts from families with a higher SEL (Min et al., 2018; Rasmussen et al., 2018). Therefore, individuals may be less satisfied with their family life.

In terms of limitations, this study employed a cross-sectional design, which precluded the establishment of causal relationships. Therefore, these relationships should be evaluated further in future longitudinal studies. A longitudinal approach would enable a deeper understanding of how diet quality, satisfaction with food-related life, and family satisfaction evolve, and how these changes influence job satisfaction. Additionally, the non-random nature of the sample used in this study limits the ability to generalise the findings to the larger population of dual-earning parents with teenage children in Chile, as it only included workers belonging to nuclear families with two parental incomes, and having adolescent children between 10 and 15 years of age. Therefore, future research should employ a random sampling method that considers families with different structures at various stages of life. Furthermore, the IASE used to measure diet quality does not encompass all food groups and quantities consumed; therefore, future studies should utilise more comprehensive instruments. Finally, by focusing only on the Santiago Metropolitan Region, cultural and socioeconomic factors specific to this area may have influenced the results. Thus, future studies should include other regions of Chile to consider differences in working conditions and their impact on job satisfaction.

Conclusions

Using the serial mediation methodology proposed by Hayes (2018), the results indicate that the relationship between diet quality and job satisfaction is mediated by satisfaction with food-related life and satisfaction with family. This finding suggests that positive experiences in these two domains are transmitted to the workplace, improving job satisfaction.

A key direction for future research is to consider the moderating effects of control variables, including gender and socioeconomic status. In this study, gender influenced the relationship between diet quality and satisfaction with food-related life, while socioeconomic level influenced the link between diet quality and satisfaction with family. In these cases, gender and socioeconomic level could act as moderators, rather than mere

control variables, influencing the strength of these relationships. Exploring these moderating effects in future studies could yield more nuanced insights into how these variables influence the relationships between diet quality, satisfaction with food-related life, family satisfaction, and job satisfaction. In addition, examining changes related to the economic sector, income, and worker autonomy is also pertinent. Furthermore, the data for this study were collected during the pandemic, so it would be interesting in the future to investigate whether the relationships found have been affected since this health crisis.

From a practical perspective, these results have significant implications for organisations, as they guide the development of strategies to increase job satisfaction and employee productivity. Companies should facilitate an environment that promotes diet quality, such as providing adequate eating spaces, access to healthy food options, and nutrition education programmes.

Declarations

Funding

This study was funded by ANID, Fondecyt Project n° 1230060, and partially by the Universidad de La Frontera, Project GI24-0013, CIENCIA PARA LA INNOVACIÓN 2030, CONSORCIO SUR-SUBANTÁRTICO, CI2030, código 20CEIN2-14142146. Ines Genero I+D+i+e, código: INGE230011.

Competing interests

The authors have no relevant financial or non-financial interests to disclose.

Ethics approval

The present research received approval from the Ethics Committee of the Universidad de La Frontera (protocol N°007_19) and was conducted under the latest version of the Declaration of Helsinki, the code of conduct of the American Psychological Association (1992), and the laws of the country where the study was carried out.

Consent to participate

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

References

- Adler, M. D., Bradley, R., Ferranna, M., Fleurbaey, M., Hammitt, J., Turquier, R., & Voorhoeve, A. (2023). How to balance lives and livelihoods in a pandemic. In D. Wilkinson and J. Savulescu (Eds.), *Pandemic Ethics: From COVID-19 to Disease X*, (pp. 189-209), Oxford University Press. <https://doi.org/10.1093/oso/9780192871688.003.0010>
- Agho, A. O., Price, J. L., & Mueller, C. W. (1992). Discriminant validity of measures of job satisfaction, positive affectivity, and negative affectivity. *Journal of Occupational and Organizational Psychology*, 65(3), 185-196. <https://doi.org/10.1111/j.2044-8325.1992.tb00496.x>
- Ajzen, I. (1985) From intentions to action: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action-Control: From cognition to behavior* (pp. 11-39). Springer-Verlag, Heidelberg. https://doi.org/10.1007/978-3-642-69746-3_2
- Alexandrova-Karamanova, A., Todorova, I., Montgomery, A., Panagopoulou, E., Costa, P., Baban, A., Davas, A., Milosevic, M., Mijakoski, D., & Gärtner, F. (2016). Burnout and health behaviors in health professionals from seven European countries. *International Archives of Occupational and Environmental Health*, 89(7), 1059-1075. <https://doi.org/10.1007/s00420-016-1143-5>
- Asociación de Investigadores de Mercado. (2016). *Cómo clasificar los grupos socioeconómicos en Chile*. <https://aimchile.cl/gse-chile/>
- Berge, J. M., MacLehose, R. F., Larson, N., Laska, M., & Neumark-Sztainer, D. (2016). Family Food Preparation and Its Effects on Adolescent Dietary Quality and Eating Patterns. *Journal of Adolescent Health*, 59(5), 530-536. <https://doi.org/10.1016/j.jadohealth.2016.06.007>
- Carretero-Dios, H., & Pérez, C. (2005). Normas para el desarrollo y revisión de estudios instrumentales. *International Journal of Clinical and Health Psychology*, 5(3), 521-551.
- Carrillo, I., Esparza, O., Gutiérrez, M., & Montañez, P. (2023). Tipo de estudio. En E. Camacho, M. Escoto, F., López, & J. Mancilla (Coords.), *Metodología aplicada a la psicología y a las ciencias de la salud* (pp. 127-149). Universidad Nacional Autónoma de México, Facultad de Estudios Superiores Iztacala.
- Chan, X. W., Kalliath, P., Chan, C., & Kalliath, T. (2020). How does family support facilitate job satisfaction? Investigating the chain mediating effects of work-family enrichment and job-related well-being. *Stress and Health*, 36(1), 97-104. <https://doi.org/10.1002/smi.2918>
- Chmiel, M., Brunner, M., Martin, R., & Schalke, D. (2012). Revisiting the Structure of Subjective Well-Being in Middle-Aged Adults. *Social Indicators Research*, 106(1), 109-116. <https://doi.org/10.1007/s11205-011-9796-7>
- Chui, H., Bryant, E., Sarabia, C., Maskeen, S., & Stewart-Knox, B. (2019). Burnout, eating behaviour traits and dietary patterns. *British Food Journal*, 122(2), 404-413. <https://doi.org/10.1108/BFJ-04-2019-0300>
- Conner, T. S., Brookie, K. L., Carr, A. C., Mainvil, L. A., & Vissers, M. C. (2017). Let them eat fruit! The effect of fruit and vegetable consumption on psychological well-being in young adults: A randomized controlled trial. *Plos One*, 12(2), e0171206. <https://doi.org/10.1371/journal.pone.0171206>
- Conner, T. S., Brookie, K. L., Richardson, A. C., & Polak, M. A. (2015). On carrots and curiosity: Eating fruit and vegetables is associated with greater flourishing in daily life. *British Journal of Health Psychology*, 20(2), 413-427. <https://doi.org/10.1111/bjhp.12113>
- Denegri, C. M., Castellanos, L. M., & Silva, L. F. (2021). *Informe sobre condiciones laborales, temores hacia el COVID-19 y satisfacción vital en profesionales de la Psicología en Chile*. Núcleo Científico Tecnológico en Ciencias y Humanidades, CEPEC. <https://bit.ly/3rDDmJS>
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71-75. <https://doi.org/fqgbmr>
- Diener, E., Lucas, R. E., & Oishi, S. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125(2), 276-302. <https://doi.org/10.1037/0033-2909.125.2.276>
- Edralin, D. M., & Del Rosario, R. V. (2013). Work and life harmony: An exploratory case study of EntrePinays. *DLSU Business & Economics Review*, 22(2), 15-36.

- Ensour, W., & Al Maaitah, H. (2024). Investigating sustainable employee wellbeing: A decade of research on burnout studies. *Corporate Governance and Organizational Behavior Review*, 8(3), 29–39. <https://doi.org/10.22495/cgobrv8i3p3>
- Erceg-Hurn, D. M., & Miroseovich, V. M. (2008). Modern robust statistical methods: An easy way to maximize the accuracy and power of your research. *American Psychologist*, 63(7), 591–601. <https://doi.org/10.1037/0003-066X.63.7.591>
- Greenhaus, J. H., & Powell, G. N. (2006). When work and family are allies: A theory of work-family enrichment. *Academy of Management Review*, 31(1), 72–92. <https://doi.org/10.5465/AMR.2006.19379625>
- Grunert, K. G., Dean, M., Raats, M. M., Nielsen, N. A., & Lumbers, M. (2007). A measure of satisfaction with food-related life. *Appetite*, 49(2), 486–493. <https://doi.org/10.1016/j.appet.2007.03.010>
- Grunert, K. G., De Bauw, M., Dean, M., Lähteenmäki, L., Maison, D., Pennanen, K., Sandell, M. A., Stasiuk, K., Stickel, L., Tarrega, A., Vainio, A., & Vranken, L. (2021). No lockdown in the kitchen: How the COVID-19 pandemic has affected food-related behaviours. *Food Research International*, 150, 110752. <https://doi.org/10.1016/j.foodres.2021.110752>
- Grunert, K. G., Chimisso, C., Lähteenmäki, L., Leardini, D., Sandell, M. A., Vainio, A., & Vranken, L. (2023). Food-related consumer behaviours in times of crisis: Changes in the wake of the Ukraine war, rising prices and the aftermath of the COVID-19 pandemic. *Food Research International*, 173, 113451. <https://doi.org/10.1016/j.foodres.2023.113451>
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Press.
- Hun, N., Urzúa, A., Leiva-Gutiérrez, J., & López-Espinoza, A. (2022). Calidad de la alimentación y estrategias de aculturación alimentaria en migrantes colombianos residentes en Chile. *Revista Española de Nutrición Humana y Dietética*, 26(3), 230–238. <https://doi.org/10.14306/renhyd.26.3.1702>
- Jones, B. L. (2018). Making time for family meals: Parental influences, home eating environments, barriers and protective factors. *Physiology & Behavior*, 193, 248–251. <https://doi.org/10.1016/j.physbeh.2018.03.035>
- Kalliath, P., Kalliath, T., Chan, X. W., & Chan, C. (2019). Linking Work–Family Enrichment to Job Satisfaction through Job Well-Being and Family Support: A Moderated Mediation Analysis of Social Workers across India. *The British Journal of Social Work*, 49(1), 234–255. <https://doi.org/10.1093/bjsw/bcy022>
- Kennedy, E. T., Ohls, J., Carlson, S., & Fleming, K. (1995). The Healthy Eating Index: Design and applications. *Journal of the American Dietetic Association*, 95(10), 1103–1108. [https://doi.org/10.1016/S0002-8223\(95\)00300-2](https://doi.org/10.1016/S0002-8223(95)00300-2)
- Matei, A., Maricuțoiu, L. P., & Virgă, D. (2021). For better or for worse family-related well-being: A meta-analysis of cross-over effects in dyadic studies. *Applied Psychology: Health and Well-Being*, 13(2), 357–376. <https://doi.org/10.1111/aphw.12253>
- Min, J., Xue, H., & Wang, Y. (2018). Association between household poverty dynamics and childhood overweight risk and health behaviours in the United States: A 8-year nationally representative longitudinal study of 16 800 children. *Pediatric Obesity*, 13(10), 590–597. <https://doi.org/10.1111/ijpo.12292>
- Ministerio de Desarrollo Social. (2016). Informe de Desarrollo Social 2016. https://www.desarrollosocialyfamilia.gob.cl/pdf/upload/Informe_de_Desarrollo_Social_2016.pdf
- Moysén, A., & Villaveces, M. (2023). Diseños de investigación. In E. Camacho, M. Escoto, F. López & J. Mancilla (Coords.), *Metodología aplicada a la psicología y a las ciencias de la salud* (pp.151–174). Universidad Nacional Autónoma de México, Facultad de Estudios Superiores Iztacala.
- Neculman, B., Sierra-Varela, L., Schnettler, B., & Villegas-Flores, N. (2025). Relationship between work-family conflict and support on construction professionals' family satisfaction: An integrated model in Chile. *Buildings*, 15(1), 14. <https://doi.org/10.3390/buildings15010014>
- Nepper, M. J., & Chai, W. (2016). Parents' barriers and strategies to promote healthy eating among school-age children. *Appetite*, 103, 157–164. <https://doi.org/10.1016/j.appet.2016.04.012>
- Norte Navarro, A.I., & Ortiz Moncada, R. (2011). Calidad de la dieta española según el índice de alimentación saludable. *Nutrición Hospitalaria*, 26(2), 330–336.
- Orellana, L., Schnettler, B., Miranda-Zapata, E., Saracostti, M., Poblete, H., Lobos, G., Adasme-Berrios, C., Lapo, M., & Concha-Salgado, A. (2023). Job satisfaction as a mediator between family-to-work conflict and satisfaction with family life: A dyadic analysis in dual-earner parents. *Applied Research in Quality of Life*, 18(1), 491–520. <https://doi.org/10.1007/s11482-022-10082-8>
- Otake, K., & Kato, K. (2017). Subjective Happiness and Emotional Responsiveness to Food Stimuli. *Journal of Happiness Studies*, 18(3), 691–708. <https://doi.org/10.1007/s10902-016-9747-8>
- Paredes, F. G., Ruiz Díaz, L., & González Cañete, N. (2018). Healthy habits and nutritional status in the work environment. *Revista Chilena de Nutrición*, 45(2), 119–127. <https://doi.org/10.4067/S0717-75182018000300119>
- Pavot, W., & Diener, E. (2008). The Satisfaction With Life Scale and the emerging construct of life satisfaction. *The Journal of Positive Psychology*, 3(2), 137–152. <https://doi.org/10.1080/17439760701756946>
- Penttinen, M. A., Virtanen, J., Laaksonen, M., Erkkola, M., Vepsäläinen, H., Kautiainen, H., & Korhonen, P. (2021). The Association between Healthy Diet and Burnout Symptoms among Finnish Municipal Employees. *Nutrients*, 13(7), 2393. <https://doi.org/10.3390/nu13072393>
- Rasmussen, M., Pedersen, T. P., Johnsen, N., Krølner, R. F., & Holstein, B. E. (2018). Persistent social inequality in low intake of vegetables among adolescents, 2002–2014. *Public Health Nutrition*, 21(9), 1649–1653. <https://doi.org/10.1017/S136898001800040X>
- Riquelme, O., & Giacomani, C. (2018). La comida en familia: La idealización de un evento social. *Revista Chilena de Nutrición*, 45(1), 65–70. <https://doi.org/10.4067/S0717-75182018000100065>
- Ruiz-Roso, M.B., de Carvalho Padilha, P., Matilla-Escalante, D. C., Brun, P., Ulloa, N., Acevedo-Correa, D., Arantes Ferreira Peres, W., Martorell, M., Rangel Bousquet Carrilho, T., de Oliveira Cardoso, L., Carrasco-Marín, F., Paternina-Sierra, K., Lopez de Las Hazas, M. C., Rodriguez-Meza, J. E., Villalba-Montero, L. F., Bernabè, G., Pauletto, A., Taci, X., Cárcamo-regla, R., Martínez, J. A. & Dávalos, A. (2020). Covid-19 confinement and changes of adolescent's dietary trends in Italy, Spain, Chile, Colombia and Brazil. *Nutrients*, 12(6), 1807. <https://doi.org/10.3390/nu12061807>
- Salinas, J., Gloria González, C., Villalobos, E., & Vio, F. (2014). Estilos de vida, alimentación y estado nutricional en trabajadores de la construcción de la Región Metropolitana de Chile [Feeding habits and lifestyles of male construction workers]. *Revista Médica de Chile*, 142(7), 833–840. <https://doi.org/10.4067/S0034-98872014000700003>
- Schleef, J., Castellanos-Alvarenga, L. M., Olivera, M. P., & Ortiz, M. S. (2024). Disentangling between-person and within-person associations of physical symptoms of depression with self-perceived health and life satisfaction: A longitudinal study in Chilean adults. *Journal of Health Psychology*, 29(12), 1377–1389. <https://doi.org/10.1177/13591053241229533>

- Schnettler, B., Hueche, C., Andrades, J., Ares, G., Miranda, H., Orellana, L., Grunert, K. (2020). How is satisfaction with food-related life conceptualized? A comparison between parents and their adolescent children in dual-headed households. *Food Quality and Preference*, 86, 104021. <https://doi.org/10.1016/j.foodqual.2020.104021>
- Schnettler, B., Miranda-Zapata, E., Orellana, L., Poblete, H., Lobos, G., Lapo, M., & Adasme-Berrios, C. (2020). Domain satisfaction and overall life satisfaction: Testing the spill-over-crossover model in Chilean dual-earner couples. *International Journal of Environmental Research and Public Health*, 17(20), 7554. <https://doi.org/10.3390/ijerph17207554>
- Schnettler, B., Miranda-Zapata, E., Orellana, L., Poblete, H., Lobos, G., Lapo, M., & Adasme-Berrios, C. (2023). Family-to-work enrichment associations between family meal atmosphere and job satisfaction in dual-earner parents. *Current Psychology*, 42(16), 13887-13905. <https://doi.org/10.1007/s12144-021-02580-z>
- Schnettler, B., Orellana, L., Miranda-Zapata, E., Saracostti, M., Poblete, H., Lobos, G., Adasme-Berrios, C., & Lapo, M. (2022). Diet quality during the COVID-19 pandemic: Effects of workplace support for families and work-to-family enrichment in dual-earner parents with adolescent children. *Appetite*, 169, 105823. <https://doi.org/10.1016/j.appet.2021.105823>
- Sirgy, M. J. (2012). *The psychology of quality of life: Hedonic well-being, life satisfaction, and eudaimonia* (2nd ed.). Springer. <https://doi.org/10.1007/978-94-007-4405-9>
- Strauser D. R. (2013). *Career development, employment, and disability in rehabilitation: From theory to practice*. Springer.
- Utter, J., Larson, N., Berge, J. M., Eisenberg, M. E., Fulkerson, J. A., & Neumark-Sztainer, D. (2018). Family meals among parents: Associations with nutritional, social and emotional wellbeing. *Preventive Medicine*, 113, 7-12. <https://doi.org/10.1016/j.ypmed.2018.05.006>
- Veenhoven, R., Chipperi, F., Kang, X., & Burger, M. (2021). Happiness and consumption: A Research synthesis using an online finding archive. *Sage Open*, 11(1). <https://doi.org/10.1177/2158244020986239>
- Venkatesh, V., Sykes, T. A., Chan, F. K. Y., Thong, J. Y. L., & Hu, P. J.-H. (2019). Children's internet addiction, family-to-work conflict, and job outcomes: A study of parent-child dyads. *MIS Quarterly*, 43(3), 903-927. <https://doi.org/10.25300/MISQ/2019/12338>
- Wang, J., Yeoh, E. K., Yung, T. K. C., Wong, M. C. S., Dong, D., Chen, X., Chan, M. K. Y., Wong, E. L. Y., Wu, Y., Guo, Z., Wang, Y., Zhao, S., & Chong, K. C. (2021). Change in eating habits and physical activities before and during the COVID-19 pandemic in Hong Kong: a cross-sectional study via random telephone survey. *Journal of the International Society of Sports Nutrition*, 18(1), Article 33. <https://doi.org/10.1186/s12970-021-00431-7>
- Warner, R. M., Frye, K., Morrell, J. S., & Carey, G. (2017). Fruit and Vegetable Intake Predicts Positive Affect. *Journal of Happiness Studies*, 18(3), 809-826. <https://doi.org/10.1007/s10902-016-9749-6>
- Xu, X., Peng, Y., Zhao, P., Hayes, R., & Jimenez, W. P. (2019). Fighting for time: Spillover and crossover effects of long work hours among dual-earner couples. *Stress and Health*, 35(4), 491-502. <https://doi.org/10.1002/smi.2882>
- Zabriskie, R. B., & McCormick, B. P. (2003). Parent and child perspectives of family leisure involvement and satisfaction with family life. *Journal of Leisure Research*, 35(2), 163-189. <https://doi.org/10.1080/00222216.2003.11949989>
- Zabriskie, R. B., & Ward, P. J. (2013). Satisfaction With Family Life Scale. *Marriage & Family Review*, 49(5), 446-463. <https://doi.org/10.1080/01494929.2013.768321>
- Zhang, Y., & Ma, Z. F. (2020). Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Local Residents in Liaoning Province, China: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health*, 17(7), 2381. <https://doi.org/10.3390/ijerph17072381>