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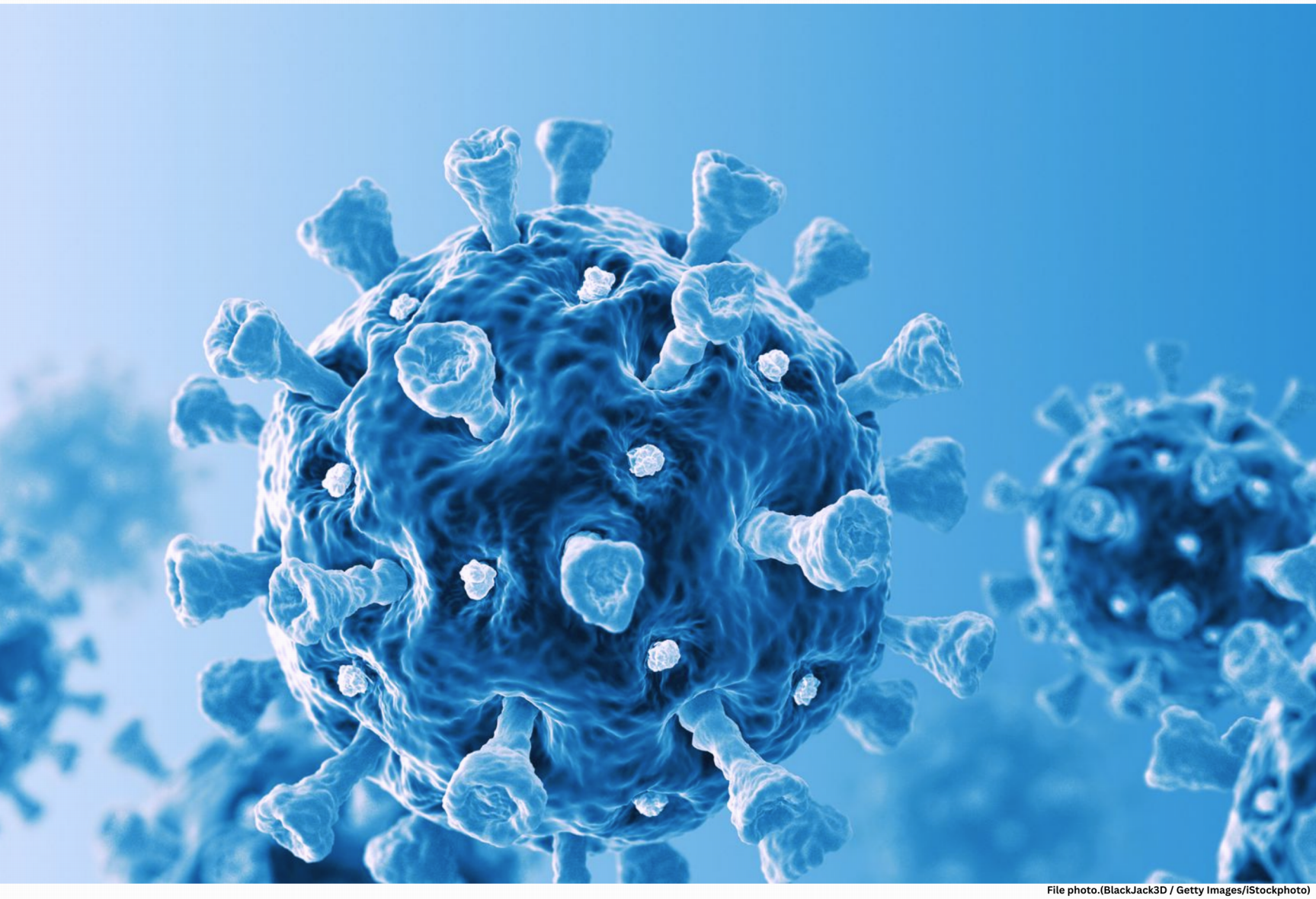

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Insights and Perspectives: A Special Issue on COVID-19

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El Honorable Comité Editorial de Horizon Interdisciplinary Journal, agradece profundamente la confianza y apoyo otorgado por las siguientes empresas quienes tuvieron a bien ser patrocinadores de esta revista científica.

Su generosidad y compromiso con la ciencia es fundamental para el desarrollo y difusión del conocimiento científico. Nos sentimos verdaderamente honrados de contar con su respaldo, y es un privilegio colocar sus emblemas en este número conmemorativo.

¡Gracias por ser fuertes aliados de la ciencia y por su apoyo inquebrantable!


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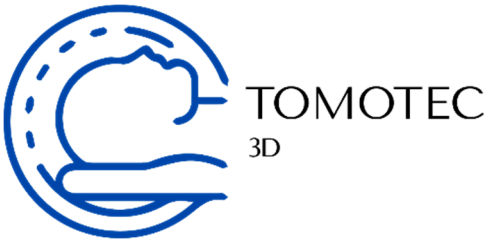
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Origins

Horizon Interdisciplinary Journal®, is an innovative project of great impact in the scientific community not only in Baja California but also in Mexico as a whole, since there is currently no journal in our country with the characteristics of Horizon. This project aims to be a space where local and national research is made known.

Horizon germinates in a genuine and well-intentioned way, it could not be otherwise. The idea arose one morning in July 2022 in the heat of a conversation between those of us who make up the Research and Teaching Department of Fundación Delia Ruiz Rivas and our beloved Boss, Mrs. María de Jesús López Ramos, a surgical nurse and entrepreneur with a visionary mind.

On that occasion the Chief questioned us as researchers: "Why do international scientific journals take so long to publish an article, outdated information should be released immediately", "Why do they charge so much, students and teachers cannot cover those expenses", "What do we need to avoid this? What do we need to avoid this, there must be an alternative", we were inclined to answer with idealistic and a bit fanciful thoughts "the only way to avoid these inconveniences is to have our own journal" without imagining that she would tell us instantly: "let's make one". This is how Horizon Interdisciplinary Journal® was born, publishing its first online issue on April 7, 2023, which was dedicated to COVID-19.

Since Horizon was conceived, it was clear that the main areas of opportunity of the existing journals had to be addressed. The main objectives were to substantially reduce publication times and costs; increase the reach of articles through two strategies: publication of full-text articles in two languages (Spanish and English) and their dissemination in social media.

As well as the removal of payment for subscription or consultation of a recently published article, which is why we always intended to be an open access journal, where no one pays to consult information or cite articles, since at Horizon we believe that we all have the right to free access to science.

The project has been led by Dr. Efraín Armenta Rojas, current Editor in Chief of the Journal, and myself, the person in charge of the Teaching and Research Department, in collaboration with Dr. Luis Jesús Villarreal Gómez, to whom we thank for the time, commitment and knowledge poured from day one into this project.

Likewise, our gratitude and admiration to each one of the members of the Editorial Board, which consists of renowned researchers in the fields of Nursing, Medicine, Psychology, Odontology, Nutrition and Chemistry, professors from the main universities of the country and the world, and who said "yes" from the first day, trusting and joining this dream. Thank you for always being willing to contribute so that Horizon Interdisciplinary Journal® fulfills its mission and vision, but above all for being great ambassadors of this, your journal.

Horizon's mission is to publish quarterly multidisciplinary scientific articles in the health sciences focused on regional and international issues in clinical, scientific, economic, social and technological terms.

Its vision for January 2030 is to be integrated into the most prestigious international indexes such as CONAHCyT, Scielo, Scimago and Journal Citation Reports, achieving an impact factor equal to or higher than 1.50 by promoting its contents among researchers, events and graduate programs nationally and internationally. The publication of articles will be strongly influenced by the relevance to contribute to the solution of regional and international problems.

Horizon Interdisciplinary Journal ® welcomes any researcher who wishes to publish under the ethical terms of research, we look forward to your manuscript, by joining this project you contribute to the development and dissemination of science in our state and country.

Science is of all and for all!

S I N C E R E L Y,
Dr. Daniela L. González Sánchez
Head of the Teaching and Research Dept.
Co-founder of Horizon Interdisciplinary Journal®.
Fundación Enfermera Delia Ruiz Rivas

Orígenes

Horizon Interdisciplinary Journal®, es un proyecto innovador y de gran impacto en la sociedad científica no solo de Baja California sino de todo México, ya que, actualmente no se cuenta en nuestro país con una revista con las características propias de Horizon. Este proyecto pretende ser un espacio donde se dé a conocer la investigación desarrollada a nivel local y nacional.

Horizon germina de una forma genuina y bien intencionada, no podrían ser de otra forma. La idea surge una mañana de julio de 2022 en el calor de una conversación entre quienes conformamos el Departamento de Investigación y Enseñanza de Fundación Delia Ruiz Rivas y nuestra querida Jefa *la Sra. María de Jesús López Ramos,* enfermera quirúrgica y empresaria con mente visionaria.

En aquella ocasión la Jefa nos cuestionó como investigadores: *"¿Por qué las revistas cientificas internacionales tardan tanto en publicar un artículo?, la información caduca debe darse a conocer de forma inmediata ", "¿Por qué cobran tanto?, los estudiantes y maestros no puede cubrir esos gastos" ,¿Qué necesitamos para evitar esto?, debe haber alguna alternativa", nos remitimos a contestar con pensamientos idealistas y un poco fantasiosos* "la única manera de poder evitar estos inconvenientes, es tener nuestra propia revista" sin imaginar que ella nos diría al instante: "hagamos una". Es así como nace ***Horizon Interdisciplinary Journal®*** publicando su primer número en línea, el 07 de abril del 2023, el cual fue dedicado a COVID-19.

Desde que se gestó Horizon se tenía claridad en atender las principales áreas de oportunidad de las revistas existentes. Convirtiéndose en objetivos primordiales el reducir sustancialmente los tiempos de publicación y los montos de la misma; aumentar el alcance de los artículos mediante dos estrategias: la publicación en texto completo en dos idiomas (español e inglés) y la difusión de los mismos en redes sociales.

Así como la eliminación de pagos por suscripción o consulta de un artículo de reciente publicación, por lo cual siempre se pensó en una revista de acceso abierto, donde nadie paga por consultar información o citar artículos, ya que en Horizon creemos en que todos tenemos derecho al acceso libre de la ciencia.

El proyecto ha sido liderado por el Dr. Efraín Armenta Rojas actual Editor en Jefe de la Revista y una servidora responsable del Dpto. de Enseñanza e Investigación en colaboración con el Dr. Luis Jesús Villarreal Gómez, a quien agradecemos el tiempo, compromiso y conocimiento vertido desde el primer día en dicho proyecto.

Así mismo nuestra gratitud y admiración a cada uno de los miembros del H. Comité Editorial, el cual se encuentra formado por grandes investigadores de las áreas de Enfermería, Medicina, Psicología, Odontología, Nutrición y Química, profesores de las principales universidades del país y el mundo, y quienes desde el primer día dijeron ¡sí!, confiando y sumándose a este sueño. Gracias por siempre estar dispuestos a contribuir para que Horizon ***Interdisciplinary Journal®*** cumpla su misión y visión, pero sobre todo por ser grandes embajadores de esta, su revista.

Horizon, tiene como misión publicar trimestralmente artículos científicos multidisciplinarios de las ciencias de la salud enfocados en atender problemáticas regionales e internacionales en términos clínicos, científicos, económicos, sociales y tecnológicos. Su visión para enero de 2030, es estar integrada en los índices de mayor prestigio internacional como CONAHCyT, Scielo, Scimago y Journal Citation Reports, alcanzando un factor de impacto igual o superior a 1.50 al promover sus contenidos entre investigadores, eventos y programas de posgrado a nivel nacional e internacional. La publicación de artículos estará fuertemente influenciada por la pertinencia para contribuir a la solución de las problemáticas regionales e internacionales.

Horizon Interdisciplinary Journal ® le abre las puertas a todo aquel investigador que desee publicar bajo los términos éticos en materia de investigación, esperamos con entusiasmo tú manuscrito, al sumarte a este proyecto contribuyes en el desarrollo y divulgación de la ciencia en nuestro estado y país.

¡La ciencia es de todos y para todos!

A t e n t a m e n t e,
Dra. Daniela L. González Sánchez
Responsable del Dpto. de Enseñanza e Investigación
Co-fundadora de ***Horizon Interdisciplinary Journal®***
Fundación Enfermera Delia Ruiz Rivas

Dear reader,

When you enter the pages of this first issue you will be contemplating the beginning of a venture that was born one day as a small idea. An idea that was nurtured and shaped by the minds of those who are passionate about knowledge. People who with diligence, dedication and sacrifice pursue the truth through science. Developing this idea has offered a once-in-a-lifetime opportunity, but also to step out of a comfort zone and dare to learn and implement knowledge that challenges one's personal capabilities.

This project has grown by leaps and bounds, from being the work of a few to requiring an ever-growing group of professionals from all health care areas. And the reason for such requirements is obvious: something of this magnitude cannot possibly succeed without support of similar dimensions.

You are indispensable so that this colossal ship called Horizon Interdisciplinary Journal can set sail safely carrying with it not only the products of the work of professionals, scientists and academics who with great dedication developed over months or years, but also the hopes and dreams of a group of people who dared to make a difference.

This journal does not belong to us, for knowledge belongs to every nation, people, tribe, language and culture that exists on this world, this journal is yours. Become an emissary of Horizon Interdisciplinary Journal, make a difference wherever you are.

Dr. Efrain Armenta Rojas
Editor-in-Chief

Estimado lector,

Cuando te adentres en las páginas de este primer número estarás contemplando el inicio de un proyecto que un día nació como una pequeña idea. Una idea que fue alimentada, y formada por las mentes de quienes son apasionados por el conocimiento. Personas que con diligencia, entrega y sacrificio persiguen la verdad a través de la ciencia. Desarrollar esa idea ha representado una oportunidad única en la vida, pero también salir de una zona de confort y aventurarse a aprender e implementar conocimientos que retan las capacidades personales.

Este proyecto ha crecido a pasos agigantados, pasando de ser el trabajo de unos pocos a necesitar de un grupo en continuo crecimiento de profesionales de todas las áreas de la salud. Y es evidente la causa de tales requerimientos, algo de esta magnitud no puede funcionar sin un apoyo de dimensiones similares.

Tú eres indispensable para que este colosal barco llamado Horizon Interdisciplinary Journal pueda zarpar seguro llevando consigo no solo los productos del trabajo de los profesionales, científicos y académicos que con gran dedicación elaboraron a lo largo de meses o años, sino también las esperanzas y sueños de un grupo de personas que se atrevieron a marcar la diferencia.

Esta revista no es nuestra, porque el conocimiento pertenece a cada nación, pueblo, tribu, lengua y cultura que existe sobre este mundo, esta revista es tuya. Conviértete en un emisario de Horizon Interdisciplinary Journal, marca la diferencia donde estés.

Dr. Efrain Armenta Rojas
Editor en Jefe

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HORIZON INTERDISCIPLINARY JOURNAL®

Psychological Distress During COVID-19 Confinement in Persons After Metabolic Surgery.

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Abstract. – Background: People suffering from obesity often experience distress and psychopathological symptoms that decrease after undergoing metabolic surgery; the confinement caused by the COVID-19 pandemic impacted the whole population in this regard. Given that individuals undergoing metabolic surgery are at increased risk of developing these disorders, it is important to identify them in order to prevent or treat them appropriately. Therefore, this study aims to determine the relationship between COVID-19-related psychological distress and psychopathological symptoms in people who underwent metabolic surgery. Methods: A cross-sectional study was conducted including 102 participants more than six months after undergoing metabolic surgery. Sociodemographic information was collected, as well as psychological distress related to COVID-19 and psychopathological symptoms measured using the SCL-90R. A Structural Equation Model was developed to evaluate the effects and correlation between variables. Results: 90.2% of the participants were women, 84% had undergone gastric sleeve surgery while the rest had undergone Roux-en-Y gastric bypass surgery. The model obtained showed a significant correlation between the subscales of the SCL 90-R and COVID-19 related psychological distress and both were negatively correlated with the age of the participants. The COVID-19-related psychological distress factor had a significant effect on fear of contagion, perception and knowledge of risk of contagion, with risk perception being the most explained with 95.8% of variance explained. In addition, the final model showed adequate goodness-of-fit indicators. Conclusions: Psychological distress caused by pandemic and confinement is evidenced by higher scores on the SCL-90R instrument in persons with metabolic surgery. However, further studies and psychometric testing with more homogeneous samples in terms of sex and surgical technique are required.

Keywords: Metabolic Surgery; Structural Equation Modelling; COVID-19; Gastrectomy; Psychological Distress.

1. Introduction

The COVID-19 pandemic disrupted people's daily lives due to the closure of schools, businesses, and changes in work routines. The confinement established by governments prevented the usual social interactions with family and community. Moreover, health systems had to adapt to deal with the emerging disease, which resulted in reduced access to primary and specialized care for people with other diseases (Patel et al., 2021).

These dramatic changes in daily routine, combined with limited social support, led

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to an increase in the levels of depression and anxiety on the population (Schmitz et al., 2020). The most severely affected individuals in this regard were those facing more serious situations such as loss of employment, passing of family members, those with a history of mental illness, and those considered to be at high risk for severe COVID-19 infection, such as those with obesity. (Fancourt et al., 2021; Jia et al., 2020; Sherman et al., 2020).

However, it should be noted that not only people with obesity were vulnerable, but also those who underwent metabolic surgery (MS) and presented micronutrient deficiency caused by the surgical technique and lack of multivitamin supplementation (Albaugh et al., 2021; Antoine et al., 2021; Carabotti et al., 2021; Chamberlain et al., 2021). These are a concern for this population since deficiencies such as vitamin D have been associated with the presence of anxiety, depression and suicidal ideation (khan et al., 2022; Kim et al., 2020; Menon et al., 2020).

Furthermore, the accelerated weight loss that these persons experience require the patient to be able to cope and adapt quickly to their new body image, without having time to reconstruct the representation of their own body (Cruzat-Mandich et al., 2019). This leads to changes in the way they relate to their environment, it has been noted that, in the early postoperative stages, patients show problems in the organization of their body image causing distress or psychological discomfort such as depression due to the constant desire to achieve an unrealistic ideal figure (Gisela Pineda-García et al., 2022).

The risk factors listed above, together with the lifestyle change (social isolation and confinement) caused by the COVID-19 pandemic (Baloch et al., 2020), had a psychological impact on a significant proportion of the population, with symptoms of anxiety, depression and stress. Other reactions that were observed include uncontrolled fear of becoming infected, feelings of loneliness, frustration and boredom, all of which have been shown to decrease psychological well-being and quality of life as they have been related to higher scores of psychopathological symptoms such as somatization (SOM), obsession-compulsion (O-C), interpersonal sensitivity (IS), depression (DEP), anxiety (ANX), hostility (HOST), phobic anxiety (PANX) and psychoticism (PSY), (Santos-Ruiz et al., 2021).

This study is of great relevance given the vulnerability of persons with MS, since no study has specifically described the psychological distress this population during the confinement caused by the COVID-19 pandemic in Latin America, which tend to present this type of symptomatology (Alonso & Olivos, 2020). This could end up jeopardizing the success of the surgery while putting these persons in danger, since in addition to presenting "emotional intake" derived from poor self-control and a limitation in coping with stressful situations, with eating behavior being a mediator between these

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conditions (Esquivias et al., 2016). This was corroborated during the confinement with people with metabolic surgery suffering from symptoms of depression and anxiety and a significant percentage of them reported taking antidepressants during this period (Andreu et al., 2022).

1.1. Aim

The present study aims to identify the possible psychological distress caused by the COVID-19 pandemic and its relationship with the development or increase of psychopathological symptoms, as well as self-perceived risk of infection by the virus after metabolic surgery in adults from the northwestern border of Mexico.

2. Materials and Methods

2.1 Study Design and Participants

The present project is a cross-sectional study conducted in the City of Tijuana municipality of the state of Baja California, México between September and November 2021. We included men and women (>18 years old), of Mexican nationality, residents of the City of Tijuana who had been submitted to Sleeve Gastrectomy (SG) or Roux-Y Gastric Bypass (RYGB) at least 6 months before the start of the study. The sample size was non-probabilistic, a database of N=250 persons was consulted and those who met the inclusion criteria were contacted by telephone by the treating surgeon that was not part of the research team to be invited. A total of n = 102 persons signed the informed consent (IC) format and were included in the study.

The study protocol was approved by the Bioethics Committee of the Autonomous University of Baja California, Mexico (1135/20-2) on January 16, 2021. To comply with the World Health Organization (WHO) derived from the COVID-19 pandemic and to keep social distancing (World Health Organization, 2021) all the formats used were adapted to be answered online through the Google Forms platform, the instrument was applied to measure the variables of interest, all this was done in a single 30 minutes session.

2.2 Data Collection

Sociodemographic information was collected using an instrument that included seven items to evaluate the COVID-19 related psychological distress. Items: 1.- Have you gotten sick with COVID-19?, 2.- If you haven't gotten sick, are you afraid of getting sick?, 4.- Do you think you're at increased risk for COVID-19 due to metabolic surgery?, 6.- Have any close family members become ill with COVID-19? and 7.- Have any close family members died from COVID-19? had dichotomous answers (yes or no); The degree of confinement was measured with item 3.- How many days a week do you stay at home?, answer options were: 1-More than five days, 2-Between three and five, 3-Less than three, 4-None. Finally, item 5: Do you know what the risk factors are for contracting COVID-19? was an open answer question regarding the

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person's knowledge about the risk factors for contracting COVID-19 due to the metabolic surgery.

The participants answer was assessed by an infectology expert, depending on the degree of agreement between the information given by the participant and the reference information published by the WHO. The answers were categorized to "zero" when the information that the participant gave did not coincide with the reference information and "one", when the information coincided with the reference information.

2.2.1 Symptom Checklist 90-R

To measure the participants psychological distress, the modified Symptom Checklist 90-Revised (SCL 90-R) by Derogatis was used (Derogatis & Cleary, 1977) . The SCL90-R is a self-report questionnaire, assessing general psychopathology and clusters of psychiatric symptoms, which was suggested by the American Society for Metabolic and Metabolic surgery (Bianciardi et al., 2019) as a valid screening measure to be used in the psychosocial evaluation and demonstrated good internal consistency and validity among candidates for metabolic surgery, the coefficients of the 9 scales range between .76-.90 (G Pineda-García et al., 2022; Ransom et al., 2010).

The questionnaire consists of 90 items with Likert-type responses ranging from 0 to 4 (0 = not at all; 1 = a little; 2 = moderately; 3 = quite a bit; 4 = extremely). The participant responded to each item according to their discomfort during the week before the application of the questionnaire. The scores for each factor were obtained by looking for the scores average (sum of items divided by the number of items).

The test is divided into nine subscales, Somatization (SOM): Discomfort related to different bodily dysfunctions (cardiovascular, respiratory, gastrointestinal) and physical pain (headache, low back pain, myalgia); Obsessive-Compulsive (OC): Thoughts, actions and impulses that are experienced as inevitable or unwanted; Interpersonal Sensitivity (IS): Feelings of inferiority and inadequacy, especially when the person compares himself to others; Depression (DEP): Dysphoric moods, lack of motivation, low energy, hopelessness and suicidal ideation; Anxiety (ANX): Symptoms of nervousness, tension, panic attacks and fears; Hostility (HOS): Characteristic thoughts, feelings and actions of the presence of negative affections of anger; Phobic Anxiety (PANX): Persistent fear responses that are irrational and disproportionate to the stimuli that provoke them (specific people, places, objects, situations); Paranoid Ideation (PI): Paranoid behaviors, thoughts of suspicion and fear of loss of autonomy; Psychoticism (PSY): States of loneliness, schizoid lifestyle, hallucinations and thought control; and additional items referring to clinical symptoms (CS): Loss of appetite, trouble sleeping, thinking about dying or dying, overeating, feeling guilty. The instrument also includes the three global scales, the Global Severity Index

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(GSI), Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST).

2.3 Data analysis

Descriptive statistics were obtained from the sociodemographic data, the ten subscales of the instrument and the three global scales. Spearman and Pearson correlations were also carried out between the SCL-90-R instrument subscales, the sociodemographic variables and the COVID-19 related psychological distress items. SPSS version 25 software for Windows was used for data processing and analysis. A *p*-value smaller than 0.05 indicated statistical significance.

2.4 Structural Equations Model

A hypothetic model was created using the SCL90-R and the COVID-19 related psychological distress items as endogenous variables and the internal perceived psychological distress (Factor 1) as well as COVID-19 related psychological distress (Factor 2) as exogenous variables.

A maximum-likelihood solution for the hypothetic model was obtained using an Analysis of Moment Structure Program (Arbuckle, 2019).

The latent factors internal perceived psychological distress and COVID-19 related psychological distress were used to estimate the sample variance–covariance matrix. The model fit was measured by the chi-square goodness-of-fit test as well as the generally accepted measures of global fit root mean square error of approximation (RMSEA); the Comparative Fit Index (CFI); Parsimony Normed Fit Index (PNFI) and Akaike Information Criterion (AIC); (Bentler, 1990).

Acceptable fit values for chi-square goodness-of-fit test, CFI and PNFI are close to 1.0 (Hoyle & Smith, 1994) with acceptable RMSEA cutoff values being close to 0.06 and lower values of AIC indicate a better fit (Bentler, 1990; Hu & Bentler, 1999).

3. Results

3.1 Sample Characteristics

The sample's sociodemographic data indicated that 90.2% of the participants were women with a mean age of $M = 39.77$, $SD = 1.05$, and 9.8% men with a mean age of M = 39.8, $SD = 9.7$; 84% had been submitted to SG while the rest underwent RYGB. Regarding the elapsed post-surgery time, 50% had been under surgery between one and three years ago, followed by 27.5% between six months and one year, and 22.5%, more than three years, the rest of the sociodemographic data can be seen in Table 1.

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Table 1. Sociodemographic characteristics of the sample included in the study.

Variable	%	n
Sex		
Male	9.8%	(n=10)
Female	90.2%	(n=92)
Sample size	n=102	
Surgical Technique		
Sleeve gastrectomy	84%	(n=85)
Roux-Y Gastric Bypass	16%	(n=17)
Time since surgery		
6 months to 1 year	27.5%	(n=28)
1 to 3 years	50%	(n=51)
Over 3 years	22.5%	(n=23)
Marital status		
Single	33.4%	(n=34)
Married	48%	(n=49)
Divorced	7.8%	(n=8)
Consensual union	8.8%	(n=9)
Widower	2%	(n=2)
Education		
Elementary school	5.9%	(n=6)
Middle school	12.8%	(n=13)
High school	23.5%	(n=24)
University	49%	(n=50)
Master	8.8%	(n=9)
Occupation		
Unemployed	2.9%	(n=3)
Housewife	20.6%	(n=21)
Employee	50%	(n=51)
Businessman	22.6%	(n=23)
Student	2.9%	(n=3)
Retired	1%	(n=1)
Employment situation during the pandemic		
Working from home	52%	(n=53)
Leaving home to work	34.3%	(n=35)
Unemployed since before the pandemic	4.9 %	(n=5)
Unemployed due to the pandemic	8.8%	(n=9)

%: Prevalence, n=Frequency

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3.3 SCL 90-R scores.

The means and standard deviation (raw scores) from the subscales of the SCL 90-R in the current sample are shown in Table 3.

It can be noted that the subscales of OC (0.71±0.62) and DEP (0.69±0.65) as well as AI (0.69±0.57) showed the highest means while PSY (0.28±0.48) was the lowest.

Table 3. Means and S.D for current sample.

Subscale	Mean	S.D
Somatization (SOM)	.65	.49
Obsessive-Compulsive (OC)	**.71**	.62
Interpersonal Sensitive (IS)	.52	.68
Depression (DEP)	**.69**	.65
Anxiety (ANX)	.47	.55
Hostility (HOS)	.53	.65
Phobic Anxiety (PANX)	.31	.54
Paranoid Ideation (PI)	.55	.69
Psychoticism (PSY)	.28	.48
Clinical Symptoms (CS)	**.69**	.57
Global Severity Index (GSI)	.55	.52
Positive Symptom Distress (PSD)	1.35	.40
Positive Symptom Total (PST)	33.23	2.91

S.D = Standard Deviation.
Bold indicate the highest means.

3.4 Psychopathological dimensions & COVID-19 related psychological distress.

Table 4 provides the correlation coefficients for the associations of the sociodemographic variables, COVID-19 related psychological distress items and the SCL 90-R subscales and global indices. A significant association was found between the age of the participants and OC, IS, DEP, HOS, PANX and PI as well as the GSI and PST. The only COVID-19 related items that showed a significant correlation with the SCL 90-R subscales were the Fear of contagion, Awareness of the risk of contagion due to metabolic surgery and Knowledge about COVID-19 risk, nonetheless they showed a significant correlation with all of the subscales as well as the general indices.

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Table 4. Correlations of the sociodemographic variables, COVID-19 related psychological distress and SCL 90-R subscales.

	Sociodemographic variables					
COVID-19 Related items	Sex	Age	Marital status	Education	Employment situation during the pandemic	Occupation
Have you gotten sick with COVID-19?	-.028	-.074	-.190	.006	**.453****	.101
If you haven't gotten sick, are you afraid of getting sick?	.069	.052	-.013	.078	-.003	.005
How many days a week do you stay at home?	-.139	.158	**.355****	-.085	-.071	.041
Do you think you're at increased risk for COVID-19 due to metabolic surgery?	**-.209***	-.011	.060	-.010	-.124	.090
Do you know what the risk factors are for contracting COVID-19?	**-.217***	-.026	.059	-.008	-.123	.094
Have any close family members become ill with COVID-19?	-.122	-.158	.027	.012	-.106	.119
Have any close family members died from COVID-19?	.015	-.171	.050	-.068	.174	-.031

	SCL 90-R Subscales and Global indices												
Sociodemographic variables	SOM	OC	IS	DEP	ANX	HOS	PANX	PI	PSY	CS	GSI	PSD	PST
Sex	-.072	-.090	-.064	.038	.034	-.082	-.093	-.043	.017	-.125	-.062	-.122	.170
Age	-.180	**-.261****	**-.263****	**-.279****	-.154	**-.208***	**-.257****	**-.243***	-.188	-.104	**-.250***	-.185	**-.273****
Marital status	.104	.086	.083	.053	.099	.156	.009	.089	.050	.052	.084	.090	.085
Education	-.095	-.037	-.168	-.043	-.017	-.130	-.062	**-.243***	-.079	-.064	-.085	-.128	.055
Employment situation during the pandemic	.067	-.035	.134	.011	.113	.168	.105	.097	**.253***	-.035	.072	.080	.032
Occupation	-.013	-.033	-.110	-.083	-.185	-.171	-.091	-.105	-.081	-.177	-.115	-.121	-.111

	SCL 90-R Subscales and Global indices												
COVID-19 Related items	SOM	OC	IS	DEP	ANX	HOS	PANX	PI	PSY	CS	GSI	PSD	PST
Have you gotten sick with COVID-19?	.001	-.029	.066	-.037	-.078	-.016	.012	.008	.15	-.024	-.015	-.013	-.045
If you haven't gotten sick, are you afraid of getting sick?	.182	-.134	-.145	.051	.112	-.147	-.112	-.146	-.022	.111	-.026	-.033	.102
How many days a week do you stay at home?	**.244***	**.297****	**.308****	**.239***	**.325****	**.359****	**.323****	**.227***	**.291****	**.295****	**.325****	**.300****	**.272****
Do you think you're at increased risk for COVID-19 due to metabolic surgery?	**.228***	**.399****	**.446****	**.386****	**.234***	**.363****	**.305****	**.292****	**.333****	**.376****	**.422****	**.379****	**.400****
Do you know what the risk factors are for contracting COVID-19?	**.221***	**.398****	**.452****	**.413****	**.261****	**.375****	**.355****	**.356****	**.359****	**.379****	**.427****	**.387****	**.406****
Have any close family members become ill with COVID-19?	.003	-.021	-.143	.109	-.019	-.044	-.042	-.068	-.016	.063	.002	.022	-.071
Have any close family members died from COVID-19?	-.007	.101	-.004	-.013	.131	.065	-.028	-.052	-.011	-.053	.007	.055	-.144

SOM = Somatization; OC = Obsessive-Compulsive; IS = Interpersonal Sensitivity; DEP = Depression; ANX = Anxiety; HOS = Hostility; PANX = Phobic Anxiety; PI = Paranoid Ideation; PSY = Psychoticism; CS=clinical Symptoms. *p< .05; **p< .01. Bold indicate statistical significance.

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3.5 Structural Equation Modeling

A structural equation model (SEM) was proposed and modeled using AMOS, the model included the variables that showed a significant correlation with the SCL 90-R subscales. In the graphical representation, rectangles are observed variables while circles correspond to residual errors, the values on the one sided arrows are standardized regression weights and double sided arrows indicate correlations.

Figure 1. Hypothesized Structural Equation Model of the Symptom Checklist 90-Revised (SCL 90-R) and the COVID-19 related psychological distress items.

The rectangles represent the observed variables; the ovals represent the errors associated with the endogenous variables: e1-e10 correspond to the SCL 90-R subscales, e11-e17 correspond to the COVID-19 related psychological distress items. One way arrows are used to represent effects and two way arrows correlations. Goodness of fit indices: χ^2=401.535, *df*=205, *p*=0.000; RMSEA: .097, GFI: .750, CFI: .879; PNFI: .696; AIC: 497.535.

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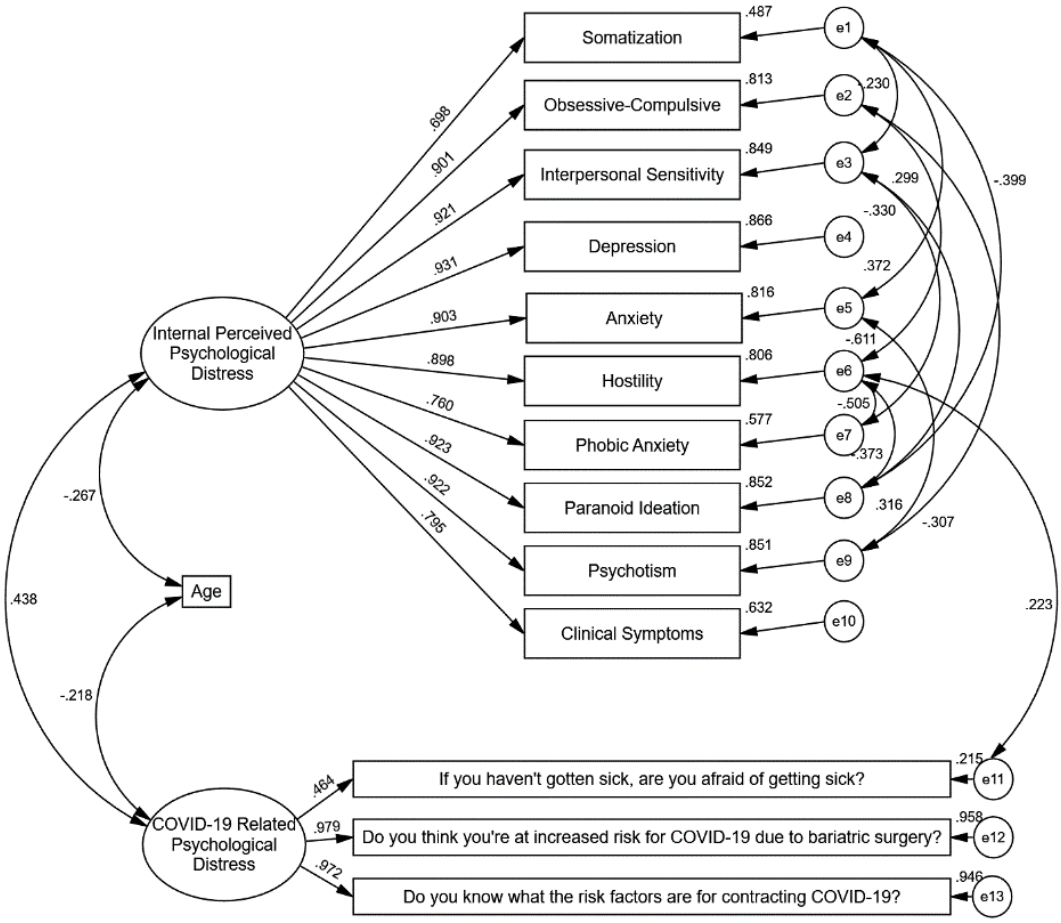
On the first SEM (Figure 1), the internal perceived psychological distress (Factor 1) explained a high percentage of all SCL 90-R subscales, and was significantly correlated to the COVID-19 related psychological distress (Factor 2), also, both factors were negatively correlated to the participants age. Furthermore, Factor 2 only had a significant effect over the fear of contagion, awareness of the risk of contagion due to the metabolic surgery and knowledge about COVID-19 risk. Lastly the sociodemographic variables of sex, education, employment status during the pandemic and marital status showed no significant effect over the subscales and COVID-19 related items that were previously correlated with. Considering these findings this SEM was modified to obtain a significant one with a better fit.

Figure 2. Final Structural Equations Model of the Symptom Checklist 90-Revised and the COVID-19 related psychological distress items.



The rectangles represent the observed variables; the ovals represent the errors associated with the endogenous variables: e1-e10 correspond to the SCL 90-R subscales, e11-e13 correspond to the COVID-19 related psychological distress items. One way arrows are used to represent effects and two way arrows correlations. Goodness of fit indices: χ^2=78.007, *df*=64, *p*=0.112; RMSEA: .047, GFI: .907, CFI: .991; PNFI: .670; AIC: 160.007.

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The final model (Figure 2) shows the same effect of the psychopathological symptoms factor on all the sub-scales of the SCL 90-R instrument, with DEP being the one that was explained in the highest proportion, with 86.6% of variance explained, and SOM the lowest with 48.5% of variance explained. At the same time, similar to what was found in the intercorrelation tests, a correlation was observed between the residuals of subscales.

The psychological distress factor related to COVID-19 had a significant effect on the fear of contagion, risk perception and risk knowledge, with risk perception being the most explained with 95.8% of variance explained. As in the first model, a significant correlation was observed between both factors together with age. Also, the final model showed better goodness-of-fit indicators than the hypothetical model.

4. Discussion

Consistently with what has been found in Mexican individuals by (González-Santos et al., 2007) and other types of target groups (Yu et al., 2019) the instrument showed a high correlation between its subscales. Such results clearly indicate that all of these dimensions are part of the same measurement instrument and that they can be incorporated into a general dimension, which in this case is represented by the global indices.

The proposed structural equation model revealed a notable correlation among the psychopathological symptoms evaluated by the SCL 90-R subscales, the age of the participants, and the psychological distress caused by the COVID-19 pandemic. It has been demonstrated by earlier research that the SCL90-R not only measures internal perceived mental concerns but also evaluates external perceived mental health concerns, including the psychological distress caused by the COVID-19 pandemic (Grande et al., 2014).

The latter was explained only by three items, concerning the fear of COVID-19 contagion, the perceived risk of contagion due to bariatric surgery and the knowledge of the risk of COVID-19 contagion. The direct knowledge of people regarding the disease has been documented as a risk factor for the development of depressive symptoms during the SARS outbreak (Wu et al., 2005). In a similar manner, the fear of COVID-19 has impacted people's mental health, manifesting in anxiety, loneliness, uncertainty, and panic (Fitzpatrick et al., 2020).

Those who were more conscious of the risk associated with a history of obesity and bariatric surgery, along with being aware of the risks associated with COVID-19 infection, expressed a greater level of fear of being infected by the virus, which in turn led to psychological discomfort, particularly in the form of hostility. This discomfort, as well as the other psychopathological symptoms evaluated, were negatively correlated with the age of

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the participants, as the youngest were the ones who showed higher scores in the instrument dimensions.

A correlation between age and psychological distress due to the pandemic has been reported in other populations, where younger persons showed greater distress than their older counterparts (Best et al., 2023). This may be explained by the fact that significant differences have been found in the coping mechanisms used by young and older adults in dealing with stress and depression (Fukase et al., 2022).

5. Conclusion

In conclusion, our study sheds light on the impact of the COVID-19 pandemic on the mental health of individuals who underwent metabolic surgery. Our findings suggest that the pandemic has had a significant effect on psychopathological symptoms, particularly obsessive-compulsive behavior, depression, and clinical symptoms. The positive and significant correlation between these symptoms and the distress caused by COVID-19 underscores the need for healthcare providers to address the mental health needs of these patients during the pandemic.

It is important to note that the SCL 90-R was not originally designed to evaluate the discomfort caused by a pandemic. Nevertheless, our results demonstrate that the scores for various dimensions of the SCL 90-R increased as a result of the distress caused by COVID-19. Of particular concern is the high score obtained in factor 10 (CS), which may contribute to the development of eating disorders and severe manifestations of depression and hostility. Therefore, it is imperative to implement interventions that aim to improve the mental health of individuals who underwent metabolic surgery.

However, our study has limitations, primarily the high prevalence of female participants and those who underwent SG in our sample. Further studies and psychometric tests are necessary to clarify the effect of the pandemic and confinement on a more diverse sample of bariatric surgery patients, including those who underwent different surgical techniques. Overall, our study provides valuable insights into the mental health needs of individuals who underwent metabolic surgery during the COVID-19 pandemic.

6. Declarations

6.1 Ethics approval and consent to participate

The study was approved by the ethics committee of the Faculty of Medicine and Psychology of the Autonomous University of Baja California (approval number: D245). All procedures involving human participants were in accordance with the ethical standards outlined in the 1964 World Medical Association Declaration of Helsinki and its later amendments or comparable ethical standards.

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6.2 Competing interests

The authors declare that they have no conflict of interest.

6.3 Funding

Not applicable.

6.4 Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

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My perspective and history with COVID-19: A near death experience.

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Abstract. - The year 2020 changed my life as well as those of many people in the world due to the COVID-19 pandemic. Personally, when I acquired the disease, I lived complex times that started with the initial signs and symptoms of this pathology and that nowadays affect my quality of life. It is especially important for me to share this chronicle of my life to share my story and the strategies that allowed me to move on.

Keywords: Perspective; COVID-19; Nursing; Intensive Care.

1. Introduction

Through the following chronicle, I wish to narrate my close experience with death due to having contracted COVID-19. These words may seem harsh, but they were (and are) part of my reality, and today I finally feel ready to tell this story. It is very important to me that other people know about my experience, including the emotions that accompanied me throughout the process, as well as the negative impact it had on me and my family. But more importantly, I want to share the strategies that allowed me to overcome it and be here today writing this memoir and testimony, because I know that there are people out there who, like me, suffered something similar and I want them to know that they are not alone, that there are always ways to move forward.

When the COVID-19 pandemic reached Tijuana, the hospitals in the municipality were quickly overwhelmed, healthcare professionals were not enough, nor was the material and equipment. Knowing that people, including co-workers, were hospitalized and/or dying without the possibility of seeing their family again was something that terrified me.

The fear of contagion and the fear of being hospitalized could be felt. Despite the latent risk, like the vast majority of healthcare workers, I continued to perform my duties, which consisted of providing consultancy to elderly people - assuming, of course, the necessary precautions - since this group of the population demanded health care attention not related to COVID. However, the care I took was not enough, nor was the fact that I seemed to be healthy.

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2. Development

2.1 The consultation

On Wednesday, December 21, 2020, I woke up and my body was not the same. I felt bad, with symptoms of a common cold, however, I never imagined that I already had COVID symptoms. The intensity of my discomfort led me to the difficult decision to go to a consultation. Upon arriving at the hospital, I could see a crowd waiting to be attended.

At that moment, I knew that the attention I was going to receive was probably not going to be the most appropriate. It was very hard and difficult to observe the helplessness of my colleagues. Due to the work overload, the lack of knowledge regarding how to treat the disease, and the shortage of personnel and supplies, they had to attend hastily and prescribe practically the same treatment based on what they had available.

At that moment, a myriad of emotions invaded me. I felt sadness, despair, frustration, fear, and helplessness all at once. Memories of when I was in that same hospital working, without imagining that I would return as a patient in the midst of a pandemic, assaulted me. This paradoxical reality seemed impossible to believe.

Emotions were taking over me when suddenly I felt great relief in the midst of my own chaos when I saw a familiar face. A nurse friend who was working in the COVID area. My friend, realizing my presence, approached me, was very empathetic and affectionate, provided me with moral and psychological support that gave me a little calm. Little by little, I calmed down and was able to see the positive things in the environment, such as the fact that the area was clean and disinfected.

When I was finally consulted, the attention I received was as I had anticipated: precarious. Like the other people, they had prescribed me treatment as if what I had was a "common cold." This led me to feel sad and desperate again, especially when the doctor told me, "hospitalization is not necessary, go home." I followed the medical instructions, but the reality is that I did not feel well. When night fell, the intensity of my discomfort made me go to the consultation for the second time, but once again it was not possible to stay hospitalized because the doctor informed me that "There are no beds available in the hospital for you to stay, stay at home."

At that moment, I was overcome with fear of having to go back home and possibly infecting my daughters, but I had no alternative. They, upon learning that there were no beds and that my health was deteriorating, were scared and didn't know what to do. When I returned home, I couldn't think clearly and felt physically unwell. As a precaution for my family, I decided to isolate myself in my room. I was very confused and afraid; on one hand, I knew I needed medical attention, but there were no beds available, and on the other hand, if I were hospitalized, I didn't

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know when I would see my daughters again.

2.2 The Visit

I feel very fortunate to have people who have become valuable friendships over the years, but none gave me as many blessings in life as the day my best friend came to my house. She is also a nurse, and despite knowing that visiting me could result in her getting infected, she came to check on me and evaluate my health. As soon as she saw me, she said, "You can't stay at home anymore. You have to go to the hospital. If you don't, you might not survive the illness." Hearing that, I experienced the greatest fear of my life. I had never felt anything like it before, but I knew she was right.

I had to muster up a lot of courage to say goodbye to my daughters, my mom, and the rest of my family. Then I got into my friend's car, and we headed to the hospital. The journey was tough, and my fear kept growing. That day, I didn't return home. I was hospitalized in a place where I no longer recognized anything or anyone. It wasn't the same place where I had worked and lived happy moments with great satisfaction. At that moment, all the staff were wearing protective gear, and the hospitalization area had become a space exclusively for treating people diagnosed with COVID. In the reserved area, there was an atmosphere of sadness and desolation.

Slowly, I lost track of time. I don't remember exactly how many days had passed. The only constant was the fear that I never stopped feeling, which turned into terror when on December 31st, my health deteriorated even more. That day, my best friend, the same one who had taken me to the hospital, who was the head nurse in that area, approached me and said, "The doctor tells me that your lungs can't take it anymore. You have to be intubated." At that moment, I felt something cold run through my body. I remember pleading with her, "Please make sure they give me the necessary attention. I don't want to die. I entrust my daughters to you." I closed my eyes as tightly as I could and prayed to God, "Lord, I put myself in your hands. Make the most appropriate decision for me." That is my last memory of that moment.

2.3 The process of living or dying.

It may seem strange, but throughout the entire time I needed respiratory support, I thought and felt that my life was "normal." As if nothing had happened, my mind was able to create a parallel life where I didn't even know I was intubated. There were also moments when I experienced happiness, fear, and sadness accompanied by tears. On several occasions, I felt as if "someone" was pressing on my chest. I had the opportunity to "talk" with people who had already passed away; and I remember that, on repeated occasions, I "walked" through the hospital corridors. In general, according to the most significant moments that I experienced while intubated, I could describe them as "chapters" which I have very present and remember perfectly.

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2.3.1 First chapter

The shortest of all chapters, I simply walked down a street in the town where I was born (Teziutlán, Puebla) where there is a church of the Virgen del Carmen. A place where I used to take my daughters when they were little and used to play.

2.3.2 Second chapter

I was having a conversation with a doctor who told me: "I'm going to transfer you to another clinic." We were going back and forth between different clinics and hospitals, since everywhere refused to receive me because I was "infected." What seemed incredible to me is that in those places, people had the shape of fruits.

2.3.3 Third chapter

I was in a place where there were sick people who told me: "You are the nurse who is going to take care of us." The area seemed like a very old movie, so much so that, although I tried, it was impossible for me to recognize the place, but the place seemed ancient.

2.3.4 Fourth Chapter

I remember dying and being immersed in what felt like a "movie," where I could see what was happening around me. I saw my mother crying bitterly, while my father tried to console her by saying, "Calm down." My mother felt misunderstood by that comment and told my dad, "You don't understand my feelings because you didn't give birth to her." At that moment, my best friend arrived and told my mom, "I'm going to take you to see your daughter's body." Suddenly, everything before disappeared, and my daughters appeared crying, but I didn't understand why. I remember this chapter so clearly that it still causes me uncertainty and sadness, especially seeing my mother devastated.

2.3.5 Fifth Chapter

There I was, immersed in a "fight" or "game" (I'm not sure which) between two characters. One claimed to be an envoy from God, and the other claimed to be an envoy from hell. Where I ended up, whether heaven or hell, depended on the winner. Those were moments that became very strange because they caused me fear and sensations that I couldn't explain.

2.3.6 Sixth Chapter

I was standing in a very peaceful place that resembled a forest where there were people in the form of elves. I felt very nostalgic. The reason being, those people didn't allow me to enter because they said I had to first go through decontamination. However, at that moment, a man appeared and told them, "Let her pass, don't worry, I will give her medicine, and after that, she can interact with you. I will assign her a place where she can recover and be calm." Suddenly, I heard the voice of a friend and other friends who had come to visit me in that enigmatic place.

2.3.7 Seventh Chapter

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The last moment I remember is in the same place as the previous chapter, where unexpectedly, I heard a supreme voice that said, "You're not going to die, don't worry." As that person spoke to me, I felt a strong tug in my chest accompanied by a very unpleasant sensation of "going and not going." Today, I know that sensation in my chest may have been the resuscitation I received.

All of these chapters are probably reflections of the emotions I experienced before being intubated and in relation to what I may have experienced, heard, or felt while sedated. I will never know for sure. It's evident that I've lost track of time between one chapter and the next. I remained intubated for a long time, where there were days when it seemed like I was going to die, and others where I was stable.

2.3.8 The Awakening

After three months of uncertainty, anguish, and suffering for my family and friends, the doctor treating me spoke to my family and said, "There is nothing else we can do. Say goodbye to her, because we have done everything we can and she is not responding." However, one day before my 42nd birthday, to everyone's surprise, I was able to wake up from sedation. There was too much confusion in my head, I felt totally disoriented, I didn't know who I was or what I was doing there.

For a moment, I was very scared, but I felt relieved to "hear my daughters' voices," but that was impossible because they still weren't allowed to come in and see me. Gradually, I became aware of my reality - I was connected to a ventilator, I had a tracheostomy! There were many machines around me; immediately, I remembered the times in my professional life when I found myself in that same scenario, but I was the nurse! This time, I was the patient! It was an extremely impactful moment.

Once I was aware of my surroundings and what was happening, the days became so hard and complex that I wouldn't want to experience anything like that again. In my room, one doctor came in and another went out, they came and went. They constantly took blood gases, which caused me a lot of pain. Until March 28, 2021, the best day up until then, they told me that I would be discharged, I could go home.

It was a very beautiful moment but full of fear for my daughters because I was going home with the tracheostomy. At that time, I didn't imagine what it would be like to go home with it, I didn't know how difficult it would be to stop relying on that small hole to breathe normally, or the anxiety or panic I would experience. That day, the nurses and doctors who had attended to me for so many days said goodbye. I finally went home!

During my stay in the hospital, I always had the support of people who care about me and who stayed around me all the time, keeping an eye on my health. However, I went through very difficult and hard times that I wouldn't want to experience again. I can't even imagine what my mother went through with my severity and not being able to visit me in the hospital because it

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wasn't allowed. We have talked about it in tears, and she has told me that this situation caused her a trauma that she remembers bitterly.

2.3.9 The Recovery

I think the hardest part of this experience has been the recovery. The reason is that despite having physical therapy and rehabilitation sessions, as well as specialized medical attention, my body was left with various significant sequelae, which limit me from continuing my life normally.

It has been a real challenge to face and adapt to my new life. Seeing my autonomy limited, losing the job that brought me so much satisfaction, and the activities I used to do regularly has been very painful for me, to the point that I have questioned whether surviving COVID was a good thing or not.

Unfortunately, I don't think I'm the only one who thinks that way at times. Anyone who has experienced a similar situation could question the same thing.

I have to admit that, although it has been difficult for me, I thank God for allowing me to live. I have truly fought every day to achieve my physical, emotional, and spiritual recovery.

And today, thanks to this testimonial memory, I have been able to come to the conclusion that if I am here, it is because God has allowed it and for some purpose He has for me. Among the strategies that have helped me to recover physically and emotionally are music therapy, deep meditation, inhalation therapy, and physical rehabilitation. In this sense, the day my therapist placed a mirror in front of me as part of the session left a profound impact on my life.

For a moment, I didn't seem to recognize myself, I experienced pain, I felt that I was not the same, it was a very striking confrontation for me. Finally, I was able to appreciate every achievement I had made up to that point, and I was able to establish that the small goals and challenges I had set for myself were being completed or were in progress.

3. Conclusion

The experience I had with COVID has been an event that has marked my life. It is clear that not only I have been in this situation, but a sector of society has as well. However, based on my experience, I would like to recommend that we should strengthen our healthcare systems, as this pandemic has taught us that we are vulnerable people and that we must be united as a society.

I would also like our national healthcare system to review the regulation of retirement and pensions. As I mentioned before, the effects of COVID-19 made it impossible for me to continue working as a specialized nurse.

Unfortunately, the institution I worked for decided to terminate my contract without any financial commitment (such as a

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pension, compensation, etc.), which has made it difficult for me both personally and financially for my family.

Public health institutions, while they have a commitment to the beneficiaries and/or people who seek consultation or treatment, have an unavoidable moral (and undoubtedly legal) commitment to the staff who work in the institution, who in reality make it possible for the entity to fulfill the social function entrusted to it by the State. It is not the institution's hand that holds the syringe or places the gauze.

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Working conditions, satisfaction and job stress in nursing in the face of the COVID-19 pandemic: a voice that must be heard

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Abstract. - The COVID-19 pandemic has caused the death of millions of people in the world, including health personnel, with Mexico being one of the countries with the greatest loss of human resources. Specifically, nursing professionals in the city of Tijuana, Baja California, were subject to early exposure to COVID-19, which caused stress and job dissatisfaction as a consequence of their working conditions. Likewise, the personnel reported feeling insecure as a result of the social phenomenon characterized by negative exposure in social networks, discrimination, rejection, verbal and physical aggression. Although the professionals demonstrated a great capacity to adapt and cope with these conditions, it is important to note that this capacity did not necessarily imply health wellbeing.

Keywords: Working conditions, Job satisfaction, Job stress, Nursing, COVID-19.

1. Introduction

The coronavirus pandemic (COVID-19), caused the death of millions of people around the world including health personnel (Trilla, 2020). According to data from the Pan American Health Organization, in the first wave, Mexico was the country with the greatest loss of health human resources worldwide (Holshue et al., 2020), with Tijuana, Baja California being the most affected municipality in this regard. This can be attributed to both the geographic and demographic characteristics of this entity, since it is the third largest municipality in the country with more than 1.7 million inhabitants. In addition, it is considered the busiest border in the world, bordering with California, United States.

In context, it is possible to think that Tijuana could have been subjected to an earlier exposure to COVID-19 than the rest of the country, this associated to the importation of cases from California,

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since, in the first wave, Tijuana reported the highest number of deaths at the national level (170 deaths), with the highest mortality rate (17.3 per 100,000 people), being almost 6 times more than the national rate (3.1 per 100,000 people), (Friedman et al., 2020).

If we analyze the problem in depth, these figures are quite predictable since the health personnel in Tijuana, like the rest of the world, faced the pandemic with a shortage of medical supplies and lack of infrastructure, which speaks of weakened health systems (Oliveira et al., 2021). This, without leaving aside the social phenomenon that was experienced throughout Mexico, characterized by discrimination, rejection, verbal and physical aggression, which was even exposed in social networks, leaving a negative message in society far from reality, regarding the work done by health professionals in the face of the pandemic. Nursing professionals demonstrated a great capacity to adapt to the situations of the work and social environment; however, it is important to establish that this capacity did not necessarily imply health well-being.

The manuscript describes the working conditions, job satisfaction and job stress experienced by nursing personnel during the first wave of the COVID-19 pandemic, findings that are described from the perspective of the personnel themselves. Finally, the impact of the pandemic on the health well-being of nursing personnel is described.

1.1 Topic Development

Although well-being and health are two words that seem synonymous, in reality they have considerable differences, this can be seen in the definition of health given by the World Health Organization (WHO), being "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity" (World Health Organization [WHO], 2014, p. 1). This definition includes the term wellbeing which has a broader scope, as it encompasses several axes that are closely linked to quality of life, economic and social wellbeing, as well as professional or personal wellbeing (Alcántara, 2008).

Despite the fact that health well-being is one of the most precious assets, along with love, family union, work or professional success, it has been affected in nursing personnel over the years by social, economic and political factors. With regard to social factors, we can highlight those that are inherent to the individual, related to family problems and/or friction between work groups, due to exhausting working hours and work overload. Political and economic factors have led to informal hiring, low wages and lack of job and social security (Zárate et al., 2020, p. 36).

These factors were exacerbated during the COVID-19 pandemic, due to the precarious working conditions of Nursing around the world such as shortage of professionals, personal protective equipment, technological tools and continuous training actions.

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Consequently, in addition to affecting the productivity of the organization and the quality of care offered to users, it had and continues to have a significant negative impact on the health well-being of the nursing professional, which unfortunately has been left in the background (Cassiani et al., 2020).

The previously described phenomenon can be explained through Betty Neuman's systems theory, which refers to the fact that well-being exists when the person interacts in harmony with his/her environment, and his/her needs are satisfied (Neuman & Fawcett, 2011, p. 12), which did not happen with the Tijuana Nursing professionals. This was confirmed in a recent research conducted in the region by the Fundación Enfermera Delia Ruíz Rivas based on this theory.

This research made it possible to identify the factors that had a negative effect on the health well-being of personnel in the locality, where social factors such as changes in lifestyle, separation from loved ones, anguish at the thought of going to work related to the fear of personal and/or family contagion, confinement and social discrimination were the main stressors that led to instability.

This research allowed us to identify the factors that had a negative effect on the health well-being of the personnel in the locality, where social factors such as changes in lifestyle, separation from loved ones, anguish at the thought of going to work related to the fear of personal and/or family contagion, confinement and social discrimination were the main stressors that led to instability.

According to the results, in the work environment, the factors that added to this problem and that favored job dissatisfaction and stress were lack of knowledge, changes in work teams, work overload, hasty entry of inexperienced personnel and emergent hospital reconversion. Not to mention the fact of having to provide intensive care to colleagues who became ill and unfortunately passed away, as well as the perceived lack of job protection that led to a sense of job disappointment.

The instability of the health well-being of professionals in Tijuana was manifested by a decrease in vitality, alterations in mental health and social function, as a result of the presence of anxiety and depression. There were even those who debuted with one or more Chronic Non-Communicable Diseases (NCDs) such as obesity, diabetes mellitus and systemic arterial hypertension. Despite the fact that the personnel with these diseases were considered vulnerable and for safety reasons had to remain at home, a high percentage had to return to work due to the lack of personnel.

Systems theory refers to the fact that the environment, in this case the workplace, has an important influence on the individual. The latter is due to the fact that work is not only an activity with productive purposes, but also a generator of a sense of belonging and identity and therefore contributes to the development

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of the person (Neuman & Fawcett, 2011, p. 8). For this reason, working conditions play a fundamental role because they are related to all those physical, social and administrative factors that affect the work environment and directly affect the worker. With all that was experienced during the pandemic, it can be inferred that nursing personnel had to face a major problem.

This is why the science of care, as nursing is known, for the first time has to raise its voice and take care of itself, that is, take care of the professional caregiver. This means that, although working conditions play an important role in the health of the worker and although this relationship is not always linear, health well-being depends on the way in which professionals respond personally to the demands of work, as well as the resources that the organization makes available to its workers.

Therefore, in order to rebuild the health well-being of nursing personnel after the COVID-19 pandemic, it is essential to work on the physical and emotional aspects in conjunction with the work environment. The aim is for the nursing professional to be able to enjoy life and at the same time to face in a better way the problems that are inherent to the person and his/her profession, either by making decisions, dealing with and adapting to difficult situations or dialoguing about his/her needs and desires.

It is important to consider that, in general, people's lives and circumstances change continuously, therefore, their character, thoughts and feelings also fluctuate. Sometimes it is normal to feel discomfort such as sadness, worry, fear or uneasiness. But these types of feelings become a problem when they begin to hinder daily life for a prolonged period of time. Therefore, they must be identified and treated early and effectively.

1.1.1 Searching for Strategies

On the other hand, nursing leaders must work together with the relevant authorities to generate strategies to improve the conditions of the work environment, where the latter offers the possibility to develop and achieve job satisfaction. This is so that workers have access to or possess a fair economic reward, as well as work and personal resources that turn work demands into a source of learning that produces job satisfaction, giving meaning to the work performed.

1.1.2 Work overload

One of the main problems in the city of Tijuana is that most personnel work between 40 and 60 hours per week, similar to working conditions in other countries (Rendón et al., 2020). This can be attributed to the lack of personnel and the need for nurses to work two shifts to improve their income, causing physical and emotional overload, negatively influencing their wellbeing.

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1.1.3 Contractual Status

During the pandemic, nursing personnel were hired on an emergency basis in the city, 47.7% of whom had a non-permanent contractual situation, i.e., temporary or fee-based. These personnel experienced stress and job dissatisfaction with respect to the work area to which they were assigned, being subjected to circumstances that constantly challenged their capacities for emotional coping, containment and resilience: the existence of great emotional pressure in the areas of direct care, ethical and moral dilemmas (Buitrago et al., 2021).

1.1.4 Labor Recognition

Regarding compensation, at the national level, the President of the Republic informed that a COVID bonus would be granted to nursing personnel working in the first line of care, and that Merit Notes would also be given in an extraordinary way to the personnel who integrated the COVID-19 patient care teams (Government of Mexico, 2020). However, in Tijuana this was not the case in all cases; there were health professionals who did not receive such compensation, either because they worked in private institutions or because in some public institutions these bonuses were raffled and were not granted to 100% of the staff, generating dissatisfaction and stress, as well as low perception of labor protection.

1.1.5 Obesity and its Relationship with the Work Environment

One aspect to highlight is that there was a significant difference between the physical activity of nursing personnel in private and public institutions; this difference may be due to the guidelines and requirements of these institutions as part of their hiring or to the fact that the personnel hired in the private sector are recent graduates and younger, so that their energy and desire to gain work skills and abilities lead them to perform greater physical activity and a greater number of functions in the labor field, in addition to having a contractual situation that does not have a fixed contract.

These data may be different from the staff of public institutions where they have a stable job and are only limited to their activities, in this sense age plays a fundamental role since in public institutions you can find older and more experienced nursing staff.

The causes of overweight and obesity are fundamentally determined by an increase in the intake of caloric foods rich in sugars and fats, coupled with a generalized decrease in physical activity, generating an energy imbalance (Barnett, 2017); this in turn influenced by genetic, behavioral, psychological and physical and social environment factors.

In this sense, nursing personnel are not exempt from overweight and obesity, considering them as a vulnerable group with a frequency that increases in those

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who are not sufficiently active, in those who increase the consumption of meals during working hours and in those who work night or rotating schedules, being the age groups from 25 to 34 years old the most frequent with overweight and from 45 to 55 years old with obesity (Verón & Auchter, 2020).

In 2022 the Centers for Disease Control and Prevention (CDC), indicated that as people's weight increases to overweight and obesity levels also increase the risks of suffering or developing NCDs such as DM2, HTN, heart disease, among others (Centers for Disease Control and Prevention, 2022; Colosia et al., 2013; National Institutes of Health, 2022; Shariq & Mckenzie, 2020).

1.1.6 Social Discrimination

An important sociocultural difference is the way in which the world's population reacted to health personnel during the pandemic, from countries that revered nursing personnel as heroes and where every night the cities resounded with a massive applause in gratitude to health personnel, valuing the risk to their own lives to attend and save the population to countries like Mexico, where some people even children saw nursing personnel as "dirty", "infected" and as a potential risk to their health; For this reason, they did not wait for verbal and physical aggressions and mistreatment, even denying them access to transportation services.

Discrimination was more than evident, so that social networks and national and international newspapers did not stop exposing the different cases that were presented (Abuabara, 2020). These facts were generators of labor and social stress that depended largely on the capabilities and resources of the worker to cope with them, as well as their culture and personal situation outside of work. It is important to remember that psychosocial factors at work can become dysfunctional negative conditions that can provoke a maladaptive response. Therefore, discrimination can be considered as a psychosocial risk factor (Montes-Berges & Ortúñez, 2021).

1.1.7 Health Well-Being and its Relationship to Job Satisfaction and Perception of Job Protection

It was observed that job satisfaction and the perception of job protection increase the health well-being of Tijuana professionals, since the higher the job satisfaction and perception, the greater the improvement in general health, physical role, vitality and social function.

On the other hand, the perception of job disappointment and job stress decrease the worker's health well-being, becoming a risk factor for their physical and mental health, affecting the worker's general health, social function and emotional role. Therefore, the health well-being of the worker depends significantly on his or her job satisfaction and the conditions in which he or she works.

According to the data found, more than 95% of the participants presented medium job satisfaction, with a predominance of

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job-related stress and interpersonal relationships with colleagues. Although job satisfaction in general is not different among the participating health institutions, it can be seen that there is a variation according to the work pressure and work monotony experienced in each institution, also including the professional competencies of the staff.

In relation to social well-being, it can be said that general health is the dimension most affected, followed by the vitality and mental health of the worker. In this sense, the working conditions experienced by workers are related to their physical function, either because of the activities they perform or the work area in which they work. Likewise, the work area in which they work is related to the physical role (techniques and procedures), the emotional aspect, mental health and work seniority; it should be noted that work seniority directly involves or affects the worker's vitality, mental health, work category and area of work of the personnel, making them more vulnerable with respect to their physical wellbeing.

Thus, it can be seen that occupational health directly affects the well-being of workers, from the perception of their work and the generation of stress in it, so that when there is little job satisfaction the worker may also perceive little protection in their work, which could generate stress and anguish in going to work, aspects that may contribute to the high probability of developing non-communicable diseases that affect their well-being and health.

2. Conclusions

The results found incite the authorities of the institutions to work on continuous improvement strategies where occupational health and well-being of workers is managed, as well as physical health, emotional and mental health aspects, among others; this in order to reduce occupational stress and reduce the risks that this entails in the worker's health according to the stipulations of NOM-035-STPS-2018 (NOM, 2018) where it is mentioned that psychosocial risk factors should be identified and the work environment and conditions should be measured to carry out prevention measures and actions to control psychosocial risks, in addition to favoring the work environment (Secretaría de Gobernación, 2018).

Therefore, it is suggested to consider the working conditions, work areas and other variables of the work environment of the nursing staff that directly influence the occupational health and well-being in health of the worker as fields of study, considering this as a safe place to maintain optimal well-being and reduce health risks.

This in turn will indirectly contribute to provide optimal quality care and warmth to users, where the risks of work stress, anxiety about going to work or low work perception are not conditions that affect the welfare and health of workers and users. In addition, it would be important to start working on action strategies to care for, reduce or promote well-being and

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occupational health in the work areas. It is hoped that the results reported will contribute to a positive change for the health of the nursing profession.

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Model of wellbeing, work dissatisfaction, and stress in nursing staff during the COVID-19 pandemic.

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Abstract.- Background: The COVID-19 pandemic has highlighted the significant deficiencies and inequities in Mexico's health sector, particularly impacting the health wellbeing of nursing personnel. Increased dissatisfaction and work stress have been reported due to new care protocols, work overload, scarcity of human and material resources, as well as the loss of colleagues and family members. The aim of this study was to develop and test a model of health wellbeing based on working conditions, work satisfaction, and stress in nursing staff during the first wave of COVID-19 in Tijuana, BC. Methods: This was a descriptive correlational study, in which measurement instruments were applied to 325 professionals to assess their health wellbeing, work satisfaction, work stress, physical activity, and perception of aspects related to the COVID-19 pandemic. Descriptive statistics, mean comparisons, as well as Pearson and Spearman correlations were performed to develop a Path Analysis model. Findings: No significant differences were found in work stress or work satisfaction with respect to the work area during the first wave of the COVID-19 pandemic. The developed model predicted the health wellbeing of nursing professionals based on their perceived work protection, work disappointment, stress, and work satisfaction. Conclusion: Work satisfaction, work stress, perceived work protection, and perceived work disappointment significantly predict health wellbeing in nursing staff in Tijuana. The developed model served as the basis for the development of a pilot intervention currently being applied to reduce work stress, increase job satisfaction, and improve interpersonal relationships.

Keywords: Nursing; Occupational stress; Work satisfaction; Well-being; COVID-19; Betty Neuman.

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1. Introducción

The coronavirus pandemic (COVID-19) has caused the loss of millions of lives around the world, including health care workers (Yamamoto-Moreno et al., 2020). According to the Pan American Health Organization, Mexico was the country with the greatest loss of human resources during the first wave. 97,632 Mexican healthcare workers were infected between February 28 and August 23, 2020. By September 3 of that year, Mexico had recorded more healthcare worker deaths from COVID-19 (1320) than any other country surpassing the United States (1077) and the United Kingdom (677), (Domínguez-Varela, 2021).

This could be explained by the fact that health personnel faced the pandemic with shortages of medical supplies, such as lack of personal protective equipment, work overload, lack of infrastructure, and weakened health systems (Agren, 2020). In addition, personnel had to face a social phenomenon characterized by discrimination, rejection, verbal and physical aggression, with nursing personnel being the most affected (Sánchez-De la Cruz et al., 2021).

Given the working conditions and the perception of aspects related to the COVID-19 pandemic, health professionals demonstrated a great capacity for adaptation; however, it is important to note that this does not necessarily imply health wellbeing (Esquivel-Chirino et al., 2021).

According to Betty Neuman's systems theory, health is dynamic and constantly changing, including a full continuous movement from wellness to illness. Optimal wellness is achieved when all the needs of the system are fully met. In this case, the system is represented by the nursing professional, who experienced a disruption in its health wellness due to job dissatisfaction and stress (Neuman & Fawcett, 2011).

Both job dissatisfaction and job stress are risk factors for the development of mental and physical health disorders in nursing personnel (Zhang et al., 2021). This was confirmed during the first wave of COVID-19, as workers presented significant physical and emotional role alterations due to job dissatisfaction and stress. The latter was related to imposed separation from loved ones due to work commitment, fear of personal and family contagion due to lack of protective equipment, and sadness due to death or illness of colleagues, confinement, and lack of physical activity (Xie et al., 2020). Reported main alterations were anxiety, depression (Ramírez-Ortiz et al., 2020), decreased vitality and negative metabolic changes such as obesity, diabetes and hypertension. (Aajal et al., 2021; Akter et al., 2022; Ruissen et al., 2021).

Moreover, perceived lack of professional skills and accomplishments were factors that contributed to job stress, since disciplinary expertise and knowledge are essential for decision making in stressful situations such as the COVID-19 pandemic. Therefore, the feeling of having a lack of knowledge about the procedures to be

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performed on patients in COVID areas contributed to the impairment of health well-being (Muñoz-Fernández et al., 2020).

This is based on the fact that work is not only a productive activity that generates resources to pay for one's own life, but also determines one's social position, provides a sense of belonging and identity, and contributes to the development of social self-concept (Pulido Guerrero et al., 2023). In this social self-concept, working conditions also play a fundamental role in triggering job dissatisfaction and stress, since they have a direct influence on the worker, on interpersonal relationships and can even alter the work environment (Canales-Vergara et al., 2016), causing friction between workgroups due to long working hours, absenteeism, work overload, (Ramírez-Ortiz et al., 2020; Xie et al., 2020), low wages, as well as lack of job and social security (Aristizabal et al., 2019). This situation was exacerbated in the city of Tijuana due to the transformation of hospitals. This generated the need for emergent training, new management organization strategies and readaptation to new work areas (Almino et al., 2021; Elizarrarás-Rivas et al., 2020). In most cases, these areas were noisy, with restricted access, inadequate lighting and insufficient human and technological resources, some of which were obsolete (Cai et al., 2020).

Further, these areas involved a high level of responsibility and intense cognitive, physical, social and emotional demands. The consequences of making mistakes were potentially irreversible, leading to increased work-related stress when performing care activities (Blanco-Donoso et al., 2018).

Nursing staff's precarious working conditions around the world are not a novelty and have been described over the years (Llop-Gironés et al., 2021). Although it is known that these can impact the productivity of the organization and the quality of nursing care provided to users, it has always been a secondary concern to document how they affect the well-being and health of the nursing profesional (Rodarte Cuevas et al., 2016).

Therefore, determining whether working conditions, job satisfaction and stress, as well as the perception of aspects related to the COVID-19 pandemic are related to job dissatisfaction and stress, and if physical activity and social support during confinement were protective factors, is a key issue.

Therefore, the aim of this study is to develop and test a health well-being model that explains the relationship between working conditions, job satisfaction and job stress in nursing staff during the first wave of COVID-19 in the city of Tijuana, BC.

2. Materials and Methods

This cross-sectional correlational study was conducted in Tijuana, Baja California, Mexico, during the period between June of 2021 and May of 2022. The target population consisted of nursing professionals who worked in the city of Tijuana during the first wave of the COVID-19 pandemic.

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2.1 Eligibility criteria

This study included both male and female individuals who worked during the first wave of the COVID-19 pandemic in public or private hospitals that were transformed, as well as fever clinics in Tijuana. Nursing professionals who worked in municipalities other than Tijuana were excluded.

2.2 Sample definition

The sample size was obtained probabilistically from a database of the Nursing Human Resources Administrative Information System, located on the official website of the General Directorate of Quality and Health Education. The total population identified was N=1901 professionals. To calculate the sample size, the finite universe formula was used with a margin of error of 0.05 and a confidence level of 95%. The final sample consisted of n=325 nursing professionals.

2.3 Variables

The exogenous variables considered in the study were work conditions, job satisfaction, work stress, physical activity and perception of aspects related to the COVID-19 pandemic, while health well-being was considered as the endogenous variable.

2.4 Instruments used to collect data

2.5.1 Personal data form

A personal data form consisting of 24 items was used: seven items that inquired about sociodemographic data: age, date of birth, sex, marital status, and number of children; nine items that explored the working conditions of the nursing personnel: degree of studies at the beginning of the pandemic, work shift during the first wave of COVID 19, work seniority, contractual status, hiring category, work area, work benefit derived from the pandemic; and finally eight items that measured personal pathological history before and one year after the first wave of the pandemic: obesity, Type II Diabetes Mellitus and Systemic Arterial Hypertension and medical care seeking.

2.5.2 SF-36 Health Survey.

To assess the current health well-being of the participants in relation to that of one year ago (first wave of COVID-19), the SF-36 Health Survey creado por Ware & Sherbourne en 1992 was used; This scale consists of 36 items that assess both positive and negative states of health and includes eight dimensions: physical function, role limitations due to physical problems, bodily pain, general health, vitality, social function, role limitations due to emotional problems, and mental health. In addition to these eight health scales, an item is included that measures the general concept of changes in the perception of current health status compared to how it was perceived in the previous year.

In order to evaluate the results, the items are coded, aggregated and transformed into a scale ranging from 0 (worst state of health) to 100 (best state of health) using

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the algorithms and indications provided in the scoring and interpretation manual of the questionnaire. Thus, a higher score in the different dimensions indicates a better state of health and/or a better quality of life.

2.5.3 Perception and opinion test on COVID-19 epidemic-related aspects.

The perception and opinion on COVID-19 epidemic-related aspects was measured with the questionnaire of the same name designed by Monterrosa-Castro et al., 2020; its objective is to address dimensions regarding governmental measures, citizen behavior and expressions of fear of the pandemic; it has 25 binary response items (Yes/No); however, for the purposes of this research a modification was made in the response options being modified from binary to Likert type with five options: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree. In addition, item 23 was excluded, since it measures social discrimination and this was evaluated using the first item of the same instrument.

2.5.4 Job stress test

The Hock Job Stress Test was designed by Hock in 1988, in order to explore stress in work environments; it consists of twelve Likert-type response items, in which responses are scored as follows: Never = 1 point, Hardly ever = 2, Seldom = 3, Sometimes = 4, Relatively often = 5 and Very often = 6. The sum of the responses is rated as follows: No stress symptoms = 0-12 points; No stress symptoms, but in alarm phase = 13-24; Mild stress = 25-36; Moderate stress = 37-48, High stress = 49-60; and over 61= Severe stress. The cut-off point is set at 25 points, indicating the presence of job stress. High scores indicate greater psychosomatic response, which corresponds to a higher level of stress. The instrument has shown high reliability in the Latin population based on Cronbach's Alpha of 0.873 (Monterrosa-Castro et al., 2020).

2.5.5 Font Roja Questionnaire

The Font Roja questionnaire created by Aranaz and Mira in 1988 and expanded by Núñez González et al. en 2007 was used. It consists of 26 items assessed on a Likert-type scale in which 1 is the minimum satisfaction level and 5 is the maximum satisfaction level, and has a total score range that goes from 26 (minimum job satisfaction) to 130 (maximum job satisfaction). According to the obtained score, there were three categories to evaluate the level of job satisfaction, low satisfaction (26-61 points), medium satisfaction (62-95 points) and high satisfaction (>95 points). The result of items 6, 7, 12, 13, 14, 14, 15, 16, 17 and 19 were recoded inversely to the rest of the items, before making the total sum.

The instrument consists of ten factors, including: job satisfaction (items 7, 10, 11 and 16), which is the degree of satisfaction experienced by the individual conditioned by his or her job: job satisfaction (items 7, 10, 11 and 16) which is the degree of satisfaction experienced by the individual

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conditioned by his/her job; job-related stress (items 2, 3, 4, 5 and 6) which corresponds to the degree of stress that the exercise of the profession brings to the individual and which is reflected mainly in the fatigue experienced, perceived responsibility and job stress; professional competence (items 22, 23 and 24), which refers to the degree to which the individual believes that his or her professional preparation coincides with what his or her job demands; work pressure (items 18 and 20), which is the degree to which the individual feels that he or she has enough time to carry out his or her work; professional promotion (items 9, 12 and 17), understood as the degree to which the individual believes that he or she can improve, both professionally and in terms of recognition for his or her work; interpersonal relationship with bosses (items 13 and 19), which is the degree to which the individual considers that he/she knows what is expected of him/her by his/her bosses; interpersonal relationship with colleagues (item 14), which is the degree of satisfaction caused in the individual by the social relationships with his/her colleagues; extrinsic status characteristics (items 8 and 15), which is the degree to which the individual is recognized as having a specific status, both in terms of compensation and independence in the organization and performance of the job; work monotony (items 1 and 21), which is the degree to which the individual is affected by the routine of relationships with colleagues and the lack of variety in the job; and satisfaction with the physical work environment (items 25 and 26), which reflects satisfaction with the physical work environment (Hernández Zavala et al., 2018; Núñez González et al., 2007). This instrument has been previously used in the Latino population demonstrating adequate consistency with a Cronbach's alpha of 0.80 (Manrique-Abril et al., 2019).

2.5.6 Physical Activity Test

To assess the physical activity of the participants, the "Brief Physical Activity Questionnaire for Primary Care Consultation" by Puig Ribera et al. was used; it consists of two items that measure the frequency and duration of vigorous and moderate intensity physical activity during a "typical" week. The items were adapted for the purposes of this research as follows: 1.- How many times per week did you engage in 20 minutes of physical activity before the COVID-19 pandemic that made you breathe fast and hard, with multiple response options: 3 or more times per week (4 items), 1 to 2 times to twice per week (2 items), or never (0 items). How many times per week did you perform 30 minutes of moderate physical activity or walk in a way that increased your heart rate or made you breathe harder than normal, with multiple response options: 5 or more times per week (4 points), 3 to 4 times per week (3 points), 1 to 2 times per week (2 points), never (0 points).

A scoring system was used to interpret the instrument, classifying participants as "sufficiently active" with a score equal to or greater than 4, and as "insufficiently active" in any other case. The questionnaire has

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demonstrated good reliability in Spanish-speaking adults (k = 0.70; 95% CI; 0.53-0.82) (Puig Ribera et al., 2012).

2.6 Pilot Test

In order to validate the SF-36 Health Questionnaire and the COVID-19 Epidemic Aspects Perception and Opinion Test in the context of this study, a pilot test was conducted. The measurement instruments were applied to nursing professionals from a private hospital located in Tijuana, Baja California. The total population of professionals in the private hospital was N=80. The sample size was calculated probabilistically using the formula for pilot tests, considering a confidence level of 95% and a probability of 0.5%, which resulted in a calculated sample size of n=59 (Viechtbauer et al., 2015). The final sample size was n=80 participants. Subsequently, Cronbach's alpha and McDonald's omega coefficients were used to determine the internal consistency of the questionnaires.

Both the SF-36 Health Questionnaire and the COVID-19 Epidemic Aspects Perception and Opinion Test showed adequate internal consistency. The SF-36 Health Questionnaire showed a Cronbach's alpha coefficient of 0.867 and a McDonald's omega coefficient of 0.900, while the COVID-19 Epidemic Aspects Perception and Opinion Test showed a Cronbach's alpha coefficient of 0.887 and a McDonald's omega coefficient of 0.896. These results indicate that both instruments are reliable and consistent in measuring the variables of interest in the sample of nursing professionals during the COVID-19 epidemic in the city of Tijuana, Baja California.

2.7 Data collection

All persons (n=325) were invited to participate voluntarily in the project, and once they gave their consent, the measuring instruments were applied. The collection of information was carried out in a single 40-minute session. Due to the COVID 19 pandemic, taking into account the recommendations issued by the World Health Organization to maintain a healthy distance and in order not to expose human resources, both the informed consent form and the application of the measurement instrument were carried out through the Google Forms platform (Nievas Soriano et al., 2020; Ruliyanti et al., 2022).

2.8 Data Processing and Analysis

The data was captured and processed using the IBM Statiscal Package for the Social Sciences (IBM SPSS) version 26.0 and Jamovi version 2.2.5 for Windows. The internal consistency of the instruments was evaluated using Cronbach's alpha and McDonald's omega tests (Deng & Chan, 2017). Descriptive statistics, Chi-square, Student's t-test and ANOVA tests were used to analyze the sociodemographic data of the participants, as well as Pearson and Spearman correlations considering a $p<0.05$ as statistical significance. Based on the variables that were significantly correlated, a statistical model was designed by means of Path Analysis using IBM AMOS 24 software.

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A maximum likelihood method was used to estimate the model parameters and Chi-square (χ2), Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Parsimonious Normalized Fit Index (PNFI) and Akaike's Information Criterion (AIC) values were reported as indicators of goodness of fit.

Acceptable fit values for Chi-square, GFI, CFI and PNFI are close to 1.0. Acceptable RMSEA values are close to or less than 0.05 while lower AIC values indicate a better fit (Bentler, 1990; Hoyle & Smith, 1994; Hu & Bentler, 1999). The results section presents the final adjusted solution, which includes as exogenous variables job satisfaction, job stress, perception of job disappointment, perception of job protection and distress at the thought of going to work, and as an endogenous variable health well-being measured by the SF-36 and its factors.

2.9 Ethical Aspects

The study complied with national ethical standards and was submitted to and approved by the Ethics and Research Committee of the Autonomous University of Baja California (UABC) with registration number 003-2022. This research complies with the universal guidelines of the Helsinki declaration of 1964, its subsequent amendments (Carlson et al., 2004) as well as the General Health Law on research in Mexico (López-Pacheco et al., 2016).

3. Results

3.1 Measuring Instruments Internal Consistency

The reliability of the measurement instruments was evaluated using Cronbach's alpha and McDonald's omega tests. All instruments scored above 0.7 in both tests, which is considered a good reliability (Deng & Chan, 2017), It should be noted that the omega values obtained were higher than those of alpha in all the instruments (Table 1).

Table 1. Measuring instruments internal consistency

Instrument	Alfa de Cronbach	Omega de McDonald
Job stress test	0.880	0.895
Font-Roja Questionnaire	0.731	0.748
SF-36 Health Questionnaire	0.918	0.928
Perception and opinion test on COVID-19 epidemic-related aspects	0.861	0.877

3.2 Sociodemographic Characteristics

The sociodemographic characteristics of the sample showed that 81% (*n*=263) of the participants were women. The mean age was 34 ± 9 years. Most of the participants were single (46.8%) and without children (45.2%), with a bachelor's degree (41%), followed by technical level (26%). The institution with the highest representation was the Ministry of Health (29.2%; *n*=95), followed by a private hospital (26.2%; *n*=85), the Mexican Social Security Institute (IMSS) (17.5%; *n*=57), Red Cross

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(12. 3%; *n*=40), Instituto de Seguridad y Servicios Sociales de los Trabajadores del Gobierno y Municipios del Estado de Baja California (ISSSTECALI) (11.5%; *n*=37) and Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (ISSSTE) (1.5%; *n*=5). It is worth mentioning that 1.5% (*n*=5) of the participants worked in both IMSS and the Ministry of Health and one person in ISSSTECALI and Ministry of Health. It is worth mentioning that, due to the nature of the statistical tests, this person was considered within the ISSSTECALI category.

The employment characteristics of the sample during the first wave of COVID-19 are shown in Table 2, including whether or not they received any type of benefit for working in the first line of care.

3.3 Physical activity and body weight changes pre- and post-pandemic

Regarding physical activity, 53.8% (*n*=175) of the professionals were classified as "Sufficiently active". No significant difference was found in the level of physical activity as a function of sex ($\chi 2$=1.04; *p*=0.306), but a significant difference was found as a function of institution ($\chi 2$=21.39; *p*=0.011), where 72.5% (*n*=50) of professionals from private institutions were classified as "Sufficiently active".

With respect to changes in body weight, 41.2% (*n*=134) of participants indicated that they were not overweight or obese prior to the pandemic, however, 58.8% (*n*=191) reported having acquired either of these conditions prior to the pandemic. 56.3% (*n*=183) of participants reported gaining weight during the pandemic, with 32.8% (*n*=60) referring a gain of between 3 and 5 kilograms, 27.9% (*n*=51) gaining less than 3 kilograms, 26.2% (*n*=48) gaining 5 to 10 kilograms, and 13.1% (*n*=24) gaining more than 10 kilograms

3.4 Pre- and post-pandemic personal pathological history

33.5% (n=109) of the sample had a personal pathological history (PPH), of which 63.3% suffered from obesity, followed by arterial hypertension (AHT) (16.5%) and type II diabetes mellitus (DM2) (11%). When asked if they had any medical control to treat these diseases, according to the self-report, the majority reported that they did (55.4%). On the other hand, 13.8% of the participants reported having had some pathology during the first wave of COVID-19, among which obesity stands out (61.5%). It is worth mentioning that 4.4% (n=2) were diagnosed with HT, DM2 and obesity. In addition, a weak positive correlation was found between weight gain and the diagnosis of some pathology during the first wave (*Rho* = 0.113, *p* = 0.041).

In addition, once they were aware of the pathology, only 44.9% of the participants sought medical attention for control; of the rest of the sample that for some reason did not go for consultation, 40% (n=26) self-medicated. Additional information is shown in Table 3.

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Table 2. Work characteristics of the sample during the first wave of COVID-19.

Variable	Prevalence	Frequency
Shift		
Fixed	2.1%	*n*=7
Morning	40%	*n*=130
Afternoon	19.7%	*n*=64
Evening	14.2%	*n*=46
Cumulative shift	8.3%	*n*=27
Rotating	8%	*n*=26
Worked two shifts	7.7%	*n*=25
Seniority		
Less than 6 months	28.6%	*n*=93
From 7 months to 1 year	6.8%	*n*=22
1 to 3 years	3.1%	*n*=10
4 to 6 years	25.5%	*n*=83
7 to 9 years	8.3%	*n*=27
More than 9 years	27.7%	*n*=90
Contractual status		
Base contract	42.8%	*n*=139
Eventual contract	30.2%	*n*=98
Trust contract	9.5%	*n*=31
Fee-based	4.9%	*n*=16
I was hired at the beginning of the pandemic	12.6%	*n*=41
Category		
Auxiliary Nurse	29.9%	*n*=97
General Nurse	46.5%	*n*=151
Specialist	7.7%	*n*=25
Floor Manager	3.1%	*n*=10
Supervisor	3.4%	*n*=11
Nursing Intern	0.9%	*n*=3
Nursing Student	5.8%	*n*=19
Manager	0.6%	*n*=2
Operator	0.3%	*n*=1
Other	1.8%	*n*=6
Work area		
First line	60%	*n*=195
Second line	29.8%	*n*=97
Other service	10.2%	*n*=33
Pandemic work benefit		
Yes	84.6%	*n*=275
No	15.4%	*n*=50
Type of Benefit		
COVID Award	0.3%	*n*=1
Occupational hazard pay	2.2%	*n*=7
I only received a bonus	0.6%	*n*=2
Change of contract	1.5%	*n*=5
COVID Bonus	42.1%	*n*=137
Other	37.8%	*n*=123
I will not receive any benefits	15.4%	*n*=50

n= number of cases

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Table 3. Personal pathologic history and disease control pre and post COVID-19

Variable	Prevalence	Frequency
Pre-COVID-19 PPH	33.5%	*n*=109
Type of Pre-COVID-19 PPH		
AHT	16.5%	*n*=18
DM2	11%	*n*=12
Obesity	63.3%	*n*=69
Other	9.2%	*n*=10
Self-reporting of AHT and DM2 medical control		
Controlled AHT	77.8%	*n*=14
Controlled DM2	66.7%	*n*=8
PPH diagnosed during the first wave of COVID-19	13.8%	*n*=45
AHT	22.2%	*n*=10
DM2	11.1%	*n*=5
Obesity	53.3%	*n*=24
AHT and DM2	2.2%	*n*=1
AHT and Obesity	2.2%	*n*=1
DM2 and Obesity	4.4%	*n*=2
AHT, DM2 and Obesity	4.4%	*n*=2
Have you sought medical attention to maintain control of your condition?		
Yes	44.9%	*n*=53
No	55.1%	*n*=65
Reason for not seeking medical care		
I don't have time to go to a doctor's office because of my workload.	16.9%	*n*=11
I don't feel "sick" enough to go to the doctor.	3.1%	*n*=2
I self-medicate	40%	*n*=26
Sometimes I attend, but I find it hard to be consistent with my appointments and treatment.	4.6%	*n*=3
I don't think it is necessary to go to a doctor	20%	*n*=13
I would like to go, but it bothers me to wait a long time to be treated.	15.4%	*n*=10

n= Number of cases PPH = Pathological Personal History; AHT= Systemic Arterial Hypertension; DM2= Type II Diabetes Mellitus

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3.5 Perception and Opinion of COVID-19 Pandemic-Related Issues

Table 4 shows the responses to the instrument on Perception and Opinion of aspects related to the COVID-19 pandemic. It can be seen that 35% of the professionals reported feeling discriminated against for being health personnel. In addition, more than 50% of the participants reported that they did not trust the officially reported numbers of cases and considered the governmental measures implemented to be insufficient.

80.7% considered that health personnel were not enough when COVID-19 cases began to increase, and more than 70% reported feeling stress or anguish because of the pandemic. Although 41.8% reported not feeling protected by the system in their professional activities, 76.1% reported feeling that they had contributed towards improving the pandemic situation. 34.2% indicated that they had been disappointed in their work due to the conditions of COVID-19. Finally, 17.3% of the professionals at some point considered resigning to protect themselves and their families.

When comparing the responses among all the institutions, significant differences were found in most of the items, with the exception of the perception of the application of governmental measures, compliance with measures by the community, insufficient health equipment to deal with the cases, the presence of nightmares with the virus, and the consideration of quitting their job. However, when the institutions were grouped into public and private, the only items in which no significant differences were found were compliance with measures by the community and insufficient health equipment to deal with cases.

3.6 Job Stress

80.1% of the professionals evaluated were in some category of stress level, with 4% in severe stress, 8% high stress, 33.5% moderate stress, 35.4% mild stress, 19.1% with no stress symptoms, but in the alarm phase, and 0% with no stress symptoms. The mean score of the instrument was 35.54 ± 11.73, which corresponds to the mild stress category.

No significant difference was found in the instrument score with respect to sex (t =-0.546; p = 0.586) or work area (F=0.592, p =0.554), but with respect to institution (F =5.998; p = 0.000), where ISSSTE personnel presented the highest stress score (45. 6 ± 8), followed by IMSS (40.4 ± 12.1), Red Cross (39.6 ± 12.8), private hospital (35.3 ± 11.7) and ISSSTECALI (32.1 ± 8.8), while those of the Ministry of Health had the lowest score (31.6 ± 10.3).

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Table 4. Prevalence of responses to the Perceptions and Opinions of COVID-19 Pandemic-Related Aspects instrument

Items	Strongly disagree	Disagree	Neither agree or disagree	Agree	Totally agree	p^1	p^2
1. Did you feel discriminated against for being healthcare personnel?	30.2%	22.5%	12.30%	32%	3%	0.015	0.002
2. Did you ever think you had symptoms related to COVID-19?	16.6%	8.3%	3.10%	64.60%	7.40%	0.000	0.000
3. Did you consider the reported case numbers in your city to be reliable?	32.3%	24.6%	13.80%	26.20%	3.10%	0.048	0.001
4. Do you think the COVID-19 testing conducted in your city was sufficient?	34.8%	31.7%	13.50%	18.50%	1.50%	0.005	0.000
5. Do you think the government measures taken against COVID-19 were sufficient?	36.9%	28.6%	14.80%	18.20%	1.20%	0.178	0.007
6. Did the community comply adequately with mandatory lockdown measures?	42.8%	41.5%	9.80%	5.50%	0.30%	0.118	0.277
7. Was the healthcare team sufficient when the cases started to increase?	50.5%	30.2%	8.30%	9.80%	1.20%	0.105	0.142
8. Did you fear needing to seek medical care as a patient at a healthcare facility?	14.8%	12.9%	11.10%	55.10%	6.20%	0.000	0.000
9. Did your family fear that you would bring home a COVID-19 infection?	10.5%	6.2%	5.80%	67.70%	9.80%	0.000	0.000
10. Did you live with family members who were in the high-risk group for COVID-19?	19.1%	11.7%	7.70%	52.90%	8.60%	0.000	0.000
11. Were you afraid of being an asymptomatic carrier?	10.8%	4.6%	4.90%	69.80%	9.80%	0.000	0.000
12. Did you ever consider moving out of your home during the COVID-19 pandemic?	25.2%	21.8%	9.20%	38.50%	5.20%	0.023	0.000
13. Did you have nightmares about the virus?	35.7%	25.2%	11.10%	24.30%	3.70%	0.142	0.001
14. Did you feel stressed due to the COVID-19 pandemic?	11.4%	10.2%	7.40%	62.80%	8.30%	0.000	0.000
15. Did you feel anxious due to the COVID-19 pandemic?	10.5%	10.2%	7.10%	64.60%	7.70%	0.000	0.000
16. Did you feel satisfied with the work you did daily?	8%	4.6%	6.80%	71.70%	8.90%	0.000	0.000
17. Did you feel protected by the system in your professional activities?	21.2%	20.6%	20%	34.80%	3.40%	0.010	0.000
18. Did you feel like you were contributing to improving the pandemic situation?	6.8%	4.6%	12.30%	67.70%	8.60%	0.000	0.000
19. Did you feel anxious at the thought of going to work?	16.3%	15.4%	13.80%	49.20%	5.20%	0.042	0.000
20. Did you think you could contract COVID-19 while performing your job?	8%	4%	7.10%	71.40%	9.50%	0.000	0.000
21. Did you consider resigning at any point to protect yourself and your family?	45.2%	25.8%	11.70%	15.10%	2.20%	0.193	0.016
22. Did you feel disappointed with your job due to the conditions of COVID-19?	24.9%	22.8%	18.20%	32%	2.20%	0.034	0.004
23. Did you have a disinfection protocol when arriving home?	7.4%	2.8%	4.60%	74.80%	10.50%	0.000	0.000
24. Were you afraid of bringing COVID-19 home?	6.8%	4.3%	4.60%	74.20%	10.20%	0.000	0.000

n= Number of cases; p^1= Comparison of responses among all institutions; p^2= Comparison of responses between public and private institutions. $p<0.05$ indicates statistical significance.

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3.7 Job Satisfaction

Regarding job satisfaction, the overall average score was 75.72 ± 7.69, which corresponds to the medium satisfaction category; according to the categories, only 0.6% (*n*=2) of the professionals presented high satisfaction, 95.4% (*n*=310) were in medium satisfaction and 4% (*n*=13) in low satisfaction. Among the ten factors included in the instrument, factor number one, which corresponds to job satisfaction, obtained the lowest mean (2.44 ± 0.64), followed by professional competence (2.65 ± 0.81), interpersonal relationship with their bosses (2.71 ± 0.82), physical work environment (2. 75 ± 1.05), job pressure (2.87 ± 1.2), job monotony (3.03 ± 0.95), career advancement (3.05 ± 0.81), extrinsic status characteristics (3.06 ± 0.76), interpersonal relationship with peers (3.40 ± 1.29) and job-related stress (3.42 ± 0.66).

In relation to the overall job satisfaction score, no significant difference was found between institutions (F = 2.000, p =0.065) or work area (F= 0.928, p =0.397), however, there was a significant difference between the factors of job satisfaction (F = 3.61; p = 0.002), job pressure (F = 5.71, p =0.001), career advancement (F = 2.31, p =0.033), extrinsic status characteristics (F = 2.18, p =0.044) and job monotony (F = 3.59, p =0.002). On the other hand, no significant difference was found with respect to sex in the overall instrument score (t = -0.832, p = 0.406), but a significant difference was found in the professional competence factor (t = -2.61, p =0.009).

Significant correlations were found between overall job satisfaction, length of employment (*Rho* = 0.165, p = 0.003), and job category (*Rho* = 0.150, p = 0.007). The dimension of job satisfaction was correlated with length of employment (*Rho* = 0.178, p = 0.001). Work-related stress was correlated with job category (*Rho* = 0.165, p = 0.003). Professional competence was correlated with length of employment (*Rho* = 0.156, p = 0.005), contractual situation (*Rho* = -0.157, p = 0.005), and job category (*Rho* = 0.187, p = 0.001). Work pressure was correlated with length of employment (*Rho* = 0.263, p < 0.01) and contractual situation (*Rho* = 0.229, p = 0.001). Professional promotion was correlated with length of employment (*Rho* = -0.125, p = 0.01) and area of work (*Rho* = -0.131, p = 0.05). Interpersonal relationship with supervisors was correlated with length of employment (*Rho* = -0.221, p = 0.01) and contractual situation (*Rho* = 0.203, p = 0.01). Extrinsic characteristics of job status were correlated with length of employment (*Rho* = 0.161, p = 0.004). Job monotony was correlated with length of employment (*Rho* = -0.154, p = 0.006) and contractual situation (*Rho* = 0.129, p = 0.020).

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Table 5. Comparison of means of SF-36 instrument dimensions among health institutions.

Dimension	Institution								*F*	*p*
	Total sample (n=325)	IMSS (*n*=57)	Health Ministry (n=95)	ISSSTE (*n*=5)	ISSSTECALI (*n*=38)	Red Cross (n=40)	Private hospital (n=85)	IMSS/Health Ministry (*n*=5)		
Physical Role	87.7 ± 17.4	79.9 ± 24.4	90.7 ± 13.6	86 ± 13.9	88.8 ± 13.9	87 ± 18.5	89.3 ± 15.9	89 ± 7.4	2.64	0.016
Physical role	73.3 ± 26.2	70.2 ± 27.9	80.3 ± 23.6	70 ± 23.1	80.4 ± 21.5	66.3 ± 26.7	68.3 ± 28.4	78.8 ± 16.3	2.74	0.012
Bodily pain	77.2 ± 24.3	72.5 ± 28.3	83.3 ± 20.9	67.6 ± 21.6	86.3 ± 17.4	74.2 ± 23.9	71.8 ± 26.1	69.6 ± 23	3.43	0.002
General Health	49.7 ± 15.8	43 ± 17.4	55 ± 15.4	40 ± 13.2	50.9 ± 14.7	49.5 ± 14.2	48.4 ± 15.2	53 ± 11	4.21	0.001
Vitality	59.1 ± 15	63.7 ± 14.8	63.2 ± 11.8	62 ± 15.2	62.7 ± 11.6	56.6 ± 14.1	56.3 ± 14.3	51 ± 12.9	3.68	0.001
Social Function	73.5 ± 24.6	67.3 ± 25.4	79.9 ± 22.1	57.5 ± 14.3	80.7 ± 23.3	64.4 ± 23.9	72.5 ± 26.6	75 ± 8.8	3.62	0.001
Emotional Role	80.2 ± 26.3	74 ± 31	87.6 ± 19.2	85 ± 14.8	85.4 ± 23.8	77.3 ± 28.5	74.5 ± 28.8	95.2 ± 4.4	3.10	0.005
Mental Health	64.2 ± 16.6	61.3 ± 16.3	69.4 ± 14.9	48.8 ± 6.6	69.3 ± 14.9	62.7 ± 15.6	59.2 ± 18	72.8 ± 13.4	5.18	0.001

n: number of cases; F= F-statistic value; p<0.05 indicates statistical significance; IMSS= Mexican Institute of Social Security; ISSSTE= Institute of Security and Social Services for State Workers; ISSSTECALI= Institute of Security and Social Services for Workers of the Government and Municipalities of the State of Baja California; results are expressed as: mean ± standard deviation

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Tabla 6. Correlation between sociodemographic variables and job stress, SF-36 and job satisfaction instruments.

	Gender	Age	PA	Job Stress	Physical Role	Physical Role	Body Pain	General Health	Vitality	Social Function	Emotional Role	Mental Health	Overall Job Satisfaction	Job Satisfaction	Job-related stress	Professional Competence	Job pressure	Career advancement	Interpersonal relationship with bosses	Interpersonal relationship with colleagues	Extrinsic status characteristics	Work monotony	Physical environment
Gender	-	-.059	.057	.026	.021	-.093	.044	-.029	-.057	-.002	.001	-.077	.032	-.007	-.074	.127*	.051	.045	.006	-.034	-.055	.062	.058
Age		-	-.145**	-.157**	-.061	.124*	.092	.098	.187**	.195**	.105	.181**	.255**	.172**	.111*	.166**	.152**	-.142*	-.084	.087	.103	-.004	.041
PA			-	-.021	.122*	-.004	.059	.116*	.020	-.015	-.056	-.060	-.015	-.093	-.023	.179**	-.002	.155**	-.050	-.078	-.118*	.098	.054
Job Stress				-	-.309**	-.242**	-.382**	-.319**	-.457**	-.447**	-.322**	-.424**	-.237**	-.272**	-.028	.042	.270**	.146**	-.144**	-.229**	-.135*	-.095	-.020
Physical Role					-	.451**	.425**	.422**	.398**	.361**	.412**	.320**	.197**	-.011	.171**	.102	-.147**	.097	.013	.101	.123*	.261**	.047
Physical Role						-	.350**	.395**	.333**	.438**	.570**	.432**	.189**	.020	.180**	.058	-.005	.040	-.065	.093	.165**	.102	.035
Body Pain							-	.458**	.504**	.473**	.272**	.359**	.245**	.170**	.149**	.051	-.074	-.026	.018	.131*	.116*	.138*	-.021
General Health								-	.528**	.436**	.344**	.474**	.208**	.053	.156**	.067	-.143**	.057	-.007	.128*	.138*	.239**	.053
Vitality									-	.475**	.384**	.670**	.381**	.236**	.167**	.084	-.216**	-.036	.087	.253**	.094	.303**	.123*
Social Function										-	.485**	.559**	.292**	.140*	.187**	.079	-.208**	-.003	.067	.217**	.207**	.195**	-.030
Emotional Role											-	.541**	.168**	-.068	.183**	.075	-.099	.010	.028	.081	.096	.222**	.024
Mental Health												-	.302**	.137*	.193**	.048	-.108	-.040	.006	.225**	.141*	.160**	.086
Overall Job Satisfaction													-	.385**	.524**	.538**	-.195**	.037	.127*	.415**	.336**	.560**	.375**
Job Satisfaction														-	-.135*	-.021	-.181**	-.197**	.179**	.127*	.067	-.015	-.018
Job-related stress															-	.222**	-.187**	.247**	-.019	.083	-.007	.478**	.017
Professional Competence																-	.032	.108	-.158**	.053	-.020	.390**	.290**
Job pressure																	-	-.055	-.685**	-.269**	-.040	-.357**	.099
Career advancement																		-	-.086	-.156**	-.047	.246**	.109*
Interpersonal relationship with bosses																			-	.246**	-.005	.127*	-.142*
Interpersonal relationship with colleagues																				-	.416**	.083	-.043
Extrinsic status characteristics																					-	.019	-.019
Work monotony																						-	.140*
Physical environment																							-

n= Number of cases; PA: Physical Activity; *= p<0.05; **= p<0.01

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3.8 Health well-being SF-36

The results of the SF-36 Health Well-being instrument revealed that the most affected dimension was General Health, with a mean score of 49.7 ± 15.8, followed by Vitality (59.1 ± 15) and Mental Health (64.2 ± 16.6). There were no significant differences in the means of the dimensions based on gender, but significant differences were found between institutions, as shown in Table 5.

Contractual status positively correlated with physical function (*Rho* = 0.153, *p* = 0.006). Work area positively correlated with physical role (*Rho* = 0.111, *p* = 0.045), emotional role (*Rho* = 0.153, *p* = 0.003), mental health (*Rho* = 0.109, *p* = 0.05), and seniority (*Rho* = 0.180, *p* = 0.001). Job category positively correlated with seniority (*Rho* = 0.139, *p* = 0.012). Seniority positively correlated with vitality (*Rho* = 0.119, *p* = 0.031), mental health (*Rho* = 0.118, *p* = 0.033), job category (*Rho* = 0.139, *p* = 0.012), and work area (*Rho* = 0.180, *p* = 0.001). Lastly, work shift negatively correlated with job category (*Rho* = -0.163, *p* = 0.003). These findings indicate that work conditions are related to the perception of health well-being among professionals and may have important implications for job satisfaction and quality of life at work.

3.9 Correlation between sociodemographic variables and labor stress, SF-36, and job satisfaction instruments.

The correlations shown in Table 6 between the instruments and the sociodemographic variables reveal important associations. It was observed, that gender correlated with professional competence, age correlated with job stress, job satisfaction, mental health, social function, vitality and physical role. In addition, job stress showed correlations with all variables except job-related stress, professional competence, job monotony and physical environment.

Particularly, work-related stress correlated with all dimensions of the SF-36, while vitality was related to overall job satisfaction, job pressure, interpersonal relationships with colleagues and job monotony. Likewise, general health correlated with work pressure, vitality and social function. Finally, significant correlations were found between all the factors of the SF-36 and between the dimensions of the job satisfaction instrument, indicating an association between different aspects of health well-being and job satisfaction.

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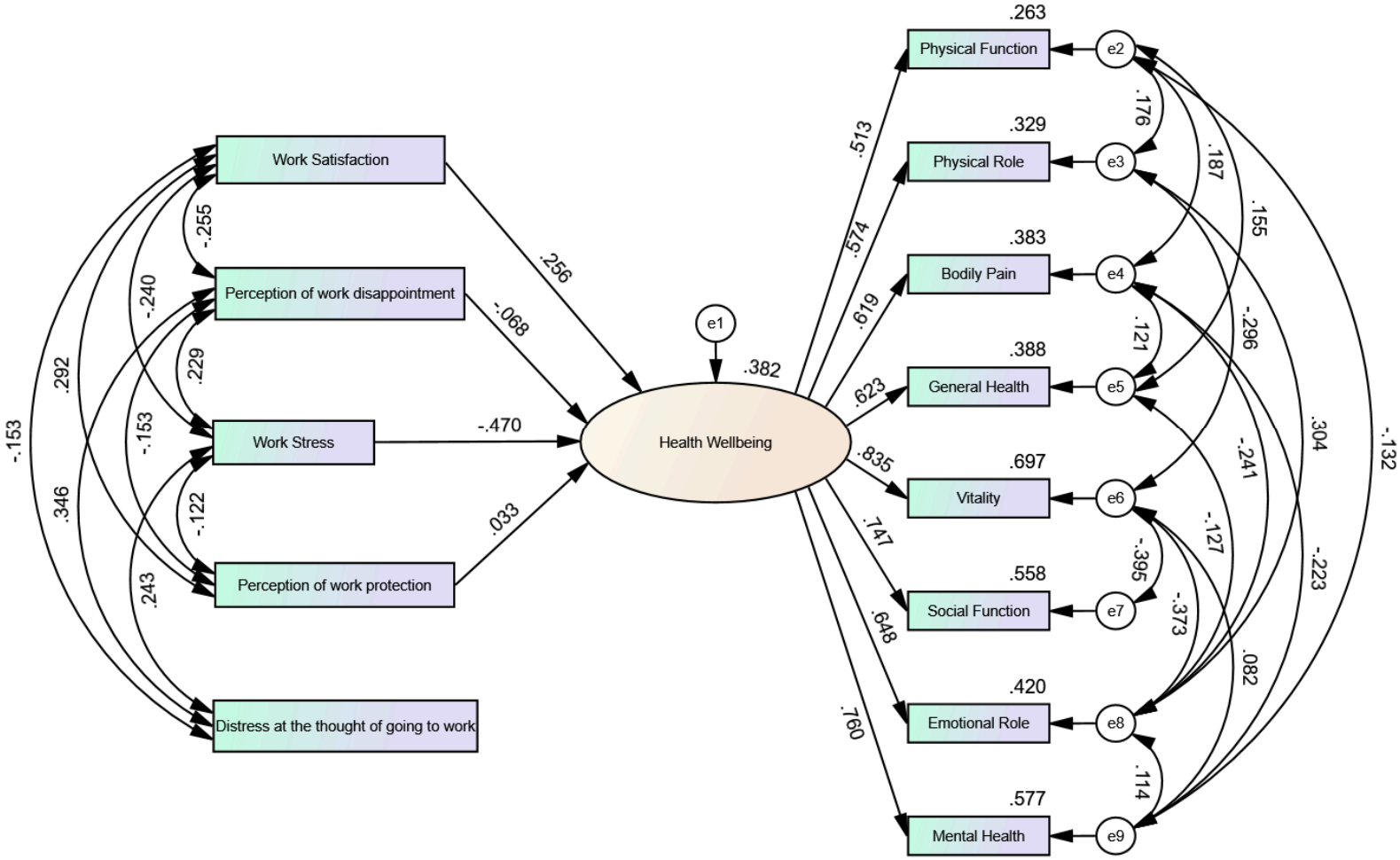
Figure 1. Health well-being explained by job stress, job satisfaction, perceived job disappointment, perceived job protection and distress at the thought of going to work.



In the graphical representation, the rectangles represent the observed variables and the ovals represent the estimated variable (Well-being in health) and errors associated with the endogenous variables (e1, e2, e3, e4, e5, e6, e7, e8 and e9), the values of the unidirectional arrows correspond to the standardized regression weights while the bidirectional arrows indicate correlations.

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3.10 Model of wellbeing, work dissatisfaction, and stress in nursing staff during the COVID-19 pandemic.

Based on the obtained results, a parsimonious model was developed with a good fit: χ^2 = 50.085, *gl* = 43, *p* = 0.213; *RMSEA* = 0.023; *GFI* = 0.978; *CFI* = 0.994; *PNFI* = 0.551; *AIC* = 146.08 (Figure 1). In the model, it was found that health well-being, which includes the dimensions of the SF-36 instrument, is explained by job satisfaction, job stress, perception of job disappointment, perception of job protection, and distress when thinking about going to work.

The model showed positive correlations between the covariates of job disappointment and job stress (*r* = 0.229) and distress when thinking about going to work (*r* = 0.346), as well as between job satisfaction and perception of job protection (*r* = 0.292), indicating that an increase in one of these variables is correlated with an increase in the other. On the other hand, negative correlations were found between job satisfaction and job disappointment (*r* = -0.255), job stress (*r* = -0.240), and distress when thinking about going to work (*r* = -0.153). Additionally, a negative correlation was found between job disappointment and perception of job protection (*r* = -0.153).

The standardized regression weights revealed that job satisfaction and perception of job protection had a positive effect on health well-being. For every unit increase in job satisfaction and perception of job protection, health well-being increased by 0.256 and 0.033, respectively (p<0.001). Additionally, the figure shows that for every unit increase in job stress, health well-being decreased by 0.470 (p<0.001), while an increase in job disappointment resulted in a decrease of 0.068 in health well-being (p<0.001). Finally, the percentage of explained variance of health well-being was 38.2%.

Health well-being demonstrated a significant effect on all dimensions of SF-36. The dimensions with the highest percentage of explained variance were vitality (69.7%), mental health (57.7%), and social functioning (55.8%). Additionally, multiple correlations were found among the dimensions, which was expected as it is a validated instrument.

Initially, gender was considered as a covariate that could potentially have an effect on health well-being. However, the results indicated that it did not influence or significantly correlate with any of the variables included in the model. This could be explained by the characteristics of the sample, as the majority of participants were female, making it difficult to clearly establish the effect of this variable.

4. Discussion

The reliability of the measurement instruments was demonstrated by means of Cronbach's alpha and McDonald's omega tests, both in the pilot test and in the main study. These results are relevant, since most research only considers Cronbach's alpha, despite the fact that the literature has proposed the use of

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statistics such as McDonald's omega to evaluate the internal consistency of the measurement instruments. This may be attributed to the high familiarity with this statistic, or to the belief that there is no difference between the results of alpha and omega (Hayes & Coutts, 2020; Malkewitz et al., 2023).

However, the latter is not entirely true or not absolute, since Cronbach's alpha assumes that all instrument dimensions are tau-equivalent, which may not be true in all cases, while McDonald's omega is based on a factorial model that may be more appropriate when it is suspected that the dimensions of the measurement instrument are not tau-equivalent, which may occur in multidimensional instruments or in specific populations (Ravinder & Saraswathi, 2020).

The sample consisted mostly of women, which is consistent to what has been reported by Carlsson en 2020, who pointed out that nursing is a job traditionally assigned to women due to its continuation of the work performed at home, not only in terms of instrumental or technical aspects, but also in the affective and empathic attitudes that characterize this profession (Prosen, 2022). However, it should be noted that these statements are based on general trends and do not necessarily apply to all situations or contexts.

With respect to working conditions, most of the nursing staff worked in the morning shift, which is consistent with a study conducted by Rendón Montoya et al. in 2020, in which a higher percentage of the participants worked this shift and worked between 40 and 60 hours per week. This workload may be attributed to the need to work two shifts due to low pay, which can cause physical and emotional overload, and have a negative impact on the well-being of nursing staff, as also reported by Dos Santos Ribeiro en 2021.

Furthermore, this study showed that, worldwide, nursing personnel were hired urgently, where 47.7% of the participants had a non-permanent contractual situation, such as temporary contracts, fee contracts, or contracts hired at the beginning of the pandemic. This was due, in part, to the fact that the characteristics of the transmission of the disease favored the rapid contagion of personnel who were in contact with infected persons, and, secondly, to the shortage of personnel due to the fact that those who belonged to the risk group because of some comorbidity were sent to shelters. This aggravated the situation, considering that before the pandemic there was already a shortage of personnel (De Melo et al., 2022).

Although 40% of the participants were not working on the front line during the first wave of the pandemic, no significant difference in stress and job satisfaction was found relative to the working area. This could be attributed to the crisis experienced by workers, who constantly faced circumstances that challenged their capacities for emotional processing, containment, and resilience. Among these circumstances were overload and

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overflow of care demand, the continuous risk of infection, insufficient and uncomfortable personal protective equipment, the need to provide not only health care but also intensive psychological support to people with the infection and their families, the great emotional pressure in the direct care areas, as well as ethical and moral dilemas (Buitrago Ramírez et al., 2021).

Regarding the government compensations granted due to the COVID-19 pandemic, 15.4% of the study participants indicated that they had not received any benefit, despite the fact that the Ministry of Health at nationwide level had announced the delivery of a COVID bonus to nursing personnel working in the first front line of care, as well as the extraordinary delivery of Merit Notes to personnel who were part of the response teams for the care of patients with COVID-19. The lack of compensation could be due to the fact that the personnel belonged to private institutions or because in some public institutions these bonuses were raffled and were not granted to 100% of the personnel, which generated job dissatisfaction, stress and a reduced perception of labor protection for those who did not receive the benefit (Gobierno de México, 2020).

Moreover, a significant difference in physical activity was found between the staff of private and public institutions. This could be due to the guidelines and requirements of each institution as part of their hiring, or to the fact that the personnel hired in the private sector were mostly recent graduates and younger, which led them to engage in more physical activity and perform a greater number of functions in the work field with the objective of acquiring job skills and abilities. In addition, it is possible that the contractual situation, which in the private sector often does not include fixed contracts, may also have influenced the higher physical activity observed. These data could be different in the case of personnel in public institutions, where there is generally greater job stability and functions may be more limited. It is important to note that age also played a key role, as in public institutions it was more common to find older nurses with contracts based on a stable basis.

Regarding the possible causes of weight gain of personnel during the pandemic, it was identified that they could be related to what was reported by Barnett en 2017. This study pointed out that the causes of overweight and obesity are mainly determined by an increase in the intake of caloric foods rich in sugars and fats, combined with a generalized decrease in physical activity, which generates an energy imbalance. These factors may be influenced by a combination of genetic, behavioral, psychological, physical and social environmental factors. During the pandemic, mobility restrictions, stress, change in routines, and availability of unhealthy foods may have contributed to an increase in caloric intake and a decrease in physical activity, which could have led to weight gain in nurses and other health care workers.

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In this sense, it was found in a study co that nursing personnel are not exempt from overweight and obesity, considering them a vulnerable group with a frequency that increases in those who are not sufficiently active, who increase the consumption of meals during working hours and who work night or rotating schedules. It was observed that the 25 to 34 age groups presented a higher frequency of overweight, while the 45 to 55 age groups presented a higher frequency of obesity, which coincides with the sociodemographic data of the sample. These findings suggest that there are factors related to age, physical activity level, and work schedules that may contribute to overweight and obesity in nurses.

In 2022, the Centers for Disease Control and Prevention indicated that as people's weight increases to overweight and obese levels, so do their risks of suffering from or developing Chronic Non-Communicable Diseases (NCDs) such as type 2 diabetes, high blood pressure, heart disease, among other diseases (Centros para el Control y la Prevención de Enfermedades, 2022; National Institutes of Health, 2022; Shariq & Mckenzie, 2020). These data are consistent with the results obtained in the study population, as a positive correlation was found between staff weight gain and the diagnosis of one or more NCDs. Such findings highlight the importance of addressing overweight and obesity in nursing staff as part of the prevention and management of NCD.

During the pandemic, an important sociocultural aspect was the way in which the world's population reacted to health personnel, including nurses. In some countries, nurses were revered as heroes and received massive applause in appreciation for their bravery and sacrifice in risking their own lives to care for and save the population. However, in other countries such as Mexico, some people, including children, viewed nurses as "dirty", "infected" and a potential health risk. This led to verbal and physical aggression, mistreatment and even denial of access to transportation services. Discrimination against nurses was evident and different cases were reported in social networks and national and international newspapers (Abuabara, 2020).

These acts of discrimination generated work and social stress in the nursing staff, which depended to a great extent on the worker's abilities and resources to face them, as well as on his or her culture and personal situation outside of work. It is important to remember that psychosocial work factors can become negative dysfunctional conditions that provoke a maladaptive response. Discrimination can therefore be considered as a psychosocial risk factor (Montes- Berges & Ortúñez Fernández, 2021). These findings highlight the importance of addressing sociocultural and psychosocial aspects of nursing care during crisis situations such as a pandemic to promote a healthy work environment and prevent discrimination and job stress.

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The obtained model revealed that job satisfaction and the perception of job protection have a positive impact on the worker's health well-being, improving their general health, physical role, vitality and social function. On the other hand, the perception of job disappointment and job stress have a negative impact on the worker's health well-being, becoming risk factors for their physical and mental health, affecting their general health, social function and emotional role. In other words, the health well-being of workers is significantly influenced by their working conditions, job satisfaction and stress in the environment in which they work. These findings highlight the importance of considering the work environment and working conditions in promoting workers' health well-being, and the need to address the factors that contribute to stress and job dissatisfaction in order to improve workers' health and well-being.

5. Conclusions

In conclusion, this study highlights the importance of addressing occupational health and well-being of nursing personnel as fundamental elements in maintaining their quality of life and their ability to provide high-quality care to patients. To improve working conditions and the work environment of these professionals, concrete strategies are suggested, such as promoting active participation of workers in decision-making, implementing workplace psychosocial support programs, reducing workload, improving salary, and promoting positive leadership practices.

It is important to recognize that challenges may arise in the implementation of these strategies, such as lack of resources and budgetary constraints, as well as possible organizational barriers. However, evidence supports the importance of effectively addressing these challenges through appropriate occupational health policies, where organizational leaders, policymakers, and other relevant stakeholders collaborate in implementing specific strategies that promote occupational health and well-being of workers in the nursing field.

One limitation of this study was that the participants belonged to a single municipality, which may affect the generalizability of the results. Further research is needed to address this limitation and strengthen the evidence in this field.

6. Statements

6.1 Conflict of interest

The authors declare no conflict of interest.

6.2 Acknowledgments

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6.3 Disponibilidad de datos y materiales

The data sets used and analyzed during the present study are available from the corresponding author upon reasonable request.

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