Comparative Analysis of the Lipid Profile Before and After Application of the Nursing Strategy

Miryam Patricia Loor Vega [a], **Maria Augusta Quijije Ortega [b]**, **Daylin Fleitas Gutierrez [c]**,
Mirella Dolores Cedeño [d]

Corresponding Author [a]

Abstract

The lipid profile is a laboratory test that determines the levels of cholesterol and triglycerides in the body. The objective of the research is to compare the current lipid profile to the initial result of the participants in the implemented nursing strategy, through laboratory tests to discover the differences and propose improvements in nursing care. It is a qualitative-quantitative, descriptive, and longitudinal study. The sample was taken from 87 people; 39 rural and 48 urban patients. The result was that the self-care of people makes it possible to improve health, due to the complications of triglycerides, and nursing interventions focused on health promotion and prevention are relevant by motivating and encouraging patients to carry a healthy lifestyle. Healthy life, promotes balanced diets in fats, carbohydrates, proteins, and sugars, performing physical activity adapted to their daily life rhythms; as well as to carry out routine check-ups to rule out any alteration in the organism that causes the lipid profile to rise.

Keywords

Contents

[a] Universidad Laica Eloy Alfaro De Manabí, Manta, Ecuador
[b] Universidad Laica Eloy Alfaro De Manabí, Manta, Ecuador
[c] Universidad Laica Eloy Alfaro De Manabí, Manta, Ecuador
[d] Universidad Estatal del Sur de Manabí, Jipijapa, Ecuador

Biography of Authors ....

1 Introduction

Due to the increase in overweight and obesity that occurs every year throughout the world, malnutrition is caused by excess food consumption of high caloric content in the foreground as a modifiable determining factor of the different chronic diseases. Cholesterol is a soft, sticky substance found inside the body, it is made up of three parts: good or HDL (stands for high-density lipoproteins), bad or LDL (stands for low-density lipoproteins). English), and triglycerides (a certain type of fat); these, when found in normal values, are not harmful to the organism (Hurtado et al., 2020; Greene et al., 2020).

At the international level, such as in Spain and Mexico, there are research studies related to the relationship between the lipid profile and lifestyles related to unbalanced nutrition and the lack of daily physical activity. In this sense, the analysis leads one to think that there could be a trend marked generalization of risk factors associated with the elevation of the lipid profile as clinical manifestations in patients with risk factors associated with a sedentary lifestyle and the scarce suggestion to the ideal consumption of the food pyramid that to take into account to maintain a healthy life (Guo et al., 2011).

In Ecuador, the four leading causes of death and disease that affects the quality of life of society are directly related to nutritional disorders due to excess caloric intake, as is the case of cardiovascular diseases, among them arterial hypertension characterized by elevation of blood pressure levels and other associated diseases. The increase in cholesterol and triglycerides is an alarming issue according to studies carried out in Ecuador, a population is observed that presented in 2012 values of triglycerides and high cholesterol by 13%, the same that increased in 2018 to 19.5 % of the total population (Bennett, 2020). It is important to pay attention to the types of fat you eat, as each form of fat influences cholesterol levels differently:

- Saturated fats: Found mainly in meat and dairy products, they signal the liver to make more LDL.
- Unsaturated fats: Found primarily in fish and plants, such as nuts, seeds, beans, and vegetable oils, certain unsaturated fats can help increase the rate at which the liver reabsorbs and breaks down LDL.
- Trans fats: are solidified vegetable oils, often found in fried, baked, and packaged foods, they not only increase bad cholesterol levels but also lower levels of good cholesterol (Hurtado et al., 2020; Sánchez-Chaparro et al., 2019).

A completely fat-free diet can also be detrimental, depleting good carbohydrate levels, impairing normal brain and nerve function, and possibly increasing inflammation. Choosing healthy fats can help lower LDL levels while maintaining and in some cases increasing HDL levels (Sánchez-Chaparro et al., 2019).

The lipid profile is one of the most requested laboratory tests to determine blood cholesterol, it allows for the verification of the levels of lipids in the blood, and can also indicate a person's risk of suffering from heart disease or atherosclerosis (Brenner et al., 1997). Too high a level of LDL cholesterol in your blood can put you at risk for heart disease and other serious health problems. High levels of LDL can cause plaque to form, a fatty substance that narrows the arteries and obstructs normal blood circulation (Cuevas & Alonso, 2016; Ferriols et al., 2016).

Very few people currently keep an annual or monthly medical record of their lipid profile, too; they do not carry out a medical control at least every year in a health institution to verify that their values are within normal parameters; without considering that adequate control can affect the reduction of the risk of suffering from chronic-degenerative diseases, a criterion that is supported by various studies.

It is for this reason that (Palmett-Ríos, 2017) carried out an investigation whose objective was to know the degree of control of blood pressure and cholesterol linked to low-density lipoproteins (c-LDL) of hypertensive patients with diabetes mellitus compared to hypertensive patients without diabetes mellitus; in the cholesterol control they showed in their results that 31.9% of patients with AHT+DM had elevated LDL compared to 12.0% of patients with AHT without DM; even though patients with diabetes are prescribed more drugs, blood pressure and LDL-c control are significantly worse than in patients without diabetes (Paoli-Valeri et al., 2005).

This research aims to compare the current lipid profile to the initial result of the participants in the nursing strategy implemented to improve their lifestyles. The comparison was made through laboratory tests to discover the differences and propose improvements in the nursing strategy.

2 Materials and Methods

The type of research of the present study is qualitative-quantitative, it implies the collection and analysis of information, based on the observation and comparison of data for the subsequent interpretation of these, the percentage numerical measurement is used to establish the different results of the participants who are part of the project. The research design is longitudinal and retrospective, since it has been working through a doctoral study, and data obtained at different times from the participants are compared to evaluate the changes since the first sample was taken in June. /2019 and the second sample was taken in December/2019. The type of research study is mixed, descriptive-observational-bibliographical, where the lipid profile of the populations is detailed, it is analyzed whether the contributions of the strategy were fulfilled by the participants, and with this implement new nursing interventions by designing a feasible strategy, this being a virtual guide with didactic and practical content. The population to study is 48 users from the urban area and 39 users from the rural area, having a total of 87 adults from 20 to 64 years old corresponding to the users who participate in the application of the nursing strategy to improve their lifestyles (McEnroe-Petitte & Farris, 2020; Blain et al., 2020). The sample corresponds to 100% of the population, which consists of 87 adults from 20 to 64 years old, 39 patients in the rural area, and 48 in the urban area, but due to different inconveniences of the users, 1 person was withdrawn from the urban area and 6 from the rural area, having a total sample of 33 participants from the rural area and 47 participants from the urban area who participate in the application of a nursing strategy to improve their lifestyles. The Inductive-deductive method is carried out since the inductive part is used through the indirect observation of the urban and rural population, and on the other hand, it is also deductive, since statistical data and information from the applied surveys are considered and compared the current results. A survey was applied, the survey is taken as a technique since it is analytical of a quantitative and/or qualitative type for data collection or to discover the opinion of the participants on the nursing strategy; For the application of this technique, informed consent and 12 questions are made to identify the state of the lipid profile and what are the self-care activities that the participants carry out for the benefit of their health; the interview is applied, since in it a dialogue or conversation is carried out aimed at different professionals who, with their knowledge and experience, can contribute concepts and suggestions for the positive benefit of the participants in this strategy (Langsted & Nordestgaard, 2019; Mehta et al., 2003).

3 Results and Discussions

The study is vital, it is related to the variation in the values of the lipid profile, it currently provides extremely important data about the vulnerability of the population to suffer from different diseases, continuously exposed to risk factors such as a sedentary lifestyle, a diet rich in saturated fats, the consumption of alcohol and tobacco, which influence the homeostatic imbalance of cellular metabolism, which can cause different pathologies: different types of diabetes, hypertension, cardiovascular diseases that manifest themselves through the alteration of the lipidic profile; however, a healthy life manages to reverse these consequences, fully maintaining the health of an individual.

From the analysis and interpretation of the lipid profile in the study comparing total cholesterol in urban and rural participants. According to the results of the laboratory samples, the total cholesterol of the urban participants in the first control, 27% of the population had cholesterol in the high limit and 8% in high value; in the second control the high limit dropped to 21% but the high value rose to 10%; In comparison to this, the rural population in its first control maintains higher percentages in the high limit with 46%, and 21% in high values, in the second control the high limit dropped to 35% but increased 25% in the high values; this means that the rural population is the one that takes very little care in terms of cholesterol.

(Suárez et al., 2008) an investigation in Quito which aimed to identify if there is a relationship between waist circumference and total cholesterol and triglycerides shows that women had 42% high total cholesterol and 50% men, showing that the data indicated that having a poor waist circumference does not mean having high cholesterol or triglycerides, that is, both a thin person and a person with a thick frame if they do not keep track of their total cholesterol, can be at risk of contracting coronary diseases. In the same way, the rural population of the present investigation can contract this type of disease if they do not follow a total cholesterol control.

According to the results, there is 4% of the urban population both in the first control and in the second control remains in the desirable levels of HDL, this means that the population can run some cardiovascular risk if the percentage does not rise. ; In the same way, in the rural population, in the first control, the ideal value is only managed by 13% of the participants and 15% in the second control. However, these percentages are not enough for the population to remain safe from cardiovascular diseases. The population with the highest cardiovascular risk is the urban population since its values are very low compared to the rural population.

(Parra et al., 2015) a study where the objective was to determine if individuals with abdominal obesity present changes related to the factors that are part of the metabolic syndrome higher than those observed in individuals without abdominal obesity, describes that the risk of presenting lower levels of HDL cholesterol was 2.3 higher in individuals with abdominal obesity than in normal individuals, this means that people with existing diseases are more likely to develop cardiovascular problems if they do not raise HDL values, however; the rest of the population must also raise the values (Kalliomäki et al., 2003; Dahlöfet al., 2005). These data determine the relationship in the results presented in this investigation.

From the analysis of the comparison of LDL cholesterol in urban and rural participants, the urban population in the first control shows that 42% of participants have borderline high LDL cholesterol, and 25% have high levels; in the second control the high limit rises to 46% of the population, and the high levels also rise to 35% of the users; in the rural population in the first control there are 31% of users who have in the high limit of LDL, and 54% in high levels; in the second control the high limit drops to 20% and in the high values it also drops to 50% of the participants, as mentioned in total cholesterol, it is confirmed that the rural population does not take care of LDL cholesterol either, increasing the risk of contracting chronic-degenerative diseases.

(Gorostidi et al., 2018) in an investigation where the objective is to evaluate the impact of physical exercise isolated and combined with a diet on the lipid profile of overweight/obese people, they mention that 66.7% of the participants decreased the values of LDL cholesterol following a proper diet in conjunction with physical activities, while those who only performed exercises had an approximately 30% decrease in their values. This shows that in this research both populations can lower their values by the following care in their diet in conjunction with physical exercises (Sanzana & Durruty, 2016).

According to the normal value of triglycerides, the urban population was with 54% of participants in the first control and increased in the second control with 69%, that is, they did carry out the recommendations of the strategy, unlike the population rural in its first control 56% of the users maintained the desirable levels, but in the second control, this percentage dropped to 40% being able to develop any pancreatic or vascular disease for not maintaining the desired values as the urban population has.

(Gonzales & Tapia, 2013) an investigation that aimed to identify if there is a relationship between waist circumference with total cholesterol and triglycerides, mentions that women presented 47% who had high triglycerides in the same way 58% of the men also had elevated triglycerides, so they may develop acute pancreatitis. This research demonstrates that both populations are following control with triglycerides to avoid these complications (José et al., 2012; Lahsen, 2014).

Analysis of the data obtained on the difference between respondents from urban and rural areas, the urban population currently suffers from high blood pressure with 19% of users, 6% suffer from other diseases such as hyperlipidemia, hypothyroidism, and colitis, while 75% still do not have any disease; In the same way, 6% of rural users suffer from high blood pressure, 12% have other diseases such as arthritis and schizophrenia, and the remaining 82% of the population remains without any disease at the moment.

Regarding lipid control, the urban population keeps track of their health, since 70% have had a blood test for their lipid control, unlike the rural population, where only 58% of users have continued to undergo check-ups to find out their lipid profile values. The follow-up of the strategy was applied, and the users were

controlled, as was the rural population with 61% at the same time; this means that after applying the strategy, very few users maintain control of their health in terms of lipid profile. According to the results of the survey, even though they do not keep continuous control of the lipid profile, 81% of the urban population know about their latest lipid values, as well as the rural population with 91% of the participants, this shows that they have the knowledge that they must improve their health status.

According to the results obtained, the urban population has 36% of users who maintain a high lipid profile, in the same way, 40% of the rural population maintains high levels of the lipid profile; If these values are not reduced, both populations will have the risk of developing chronic-degenerative diseases, so it is important to know what knowledge the population has about the diseases that can cause high values of the lipid profile, as shown in Table 1.

Table 1
Urban knowledge of diseases caused by alteration of the lipid profile

Categories	Population		Rural Population	
	Frequency	Percentage	Frequency	Percentage (%)
Yes	36	77%	19	58
No	11	23%	14	42

Source: survey results

According to the data in the survey carried out, 77% of users of the urban population knows the diseases caused by having high cholesterol and triglycerides, as does the rural population with 58% of users, but there is still a lack of concern to prevent these diseases from developing in each of the participants. Figure 1 shows the results related to the factors that influence high cholesterol levels.
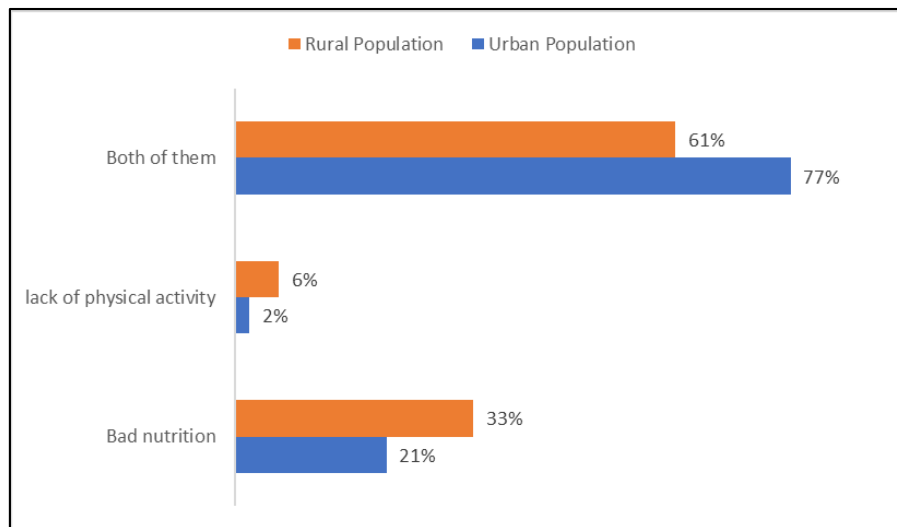

Figure 1. Factors that increase cholesterol and triglyceride levels
Source: survey results

To the results obtained, 77% of urban users say that a poor diet together with a lack of physical activity causes an increase in cholesterol and triglycerides, however, 33% of the rural population say that poor diet alone is the biggest cause. Consider genetic factors, poor diet, alcohol consumption, sedentary lifestyle, smoking, excessive consumption of junk food and fried foods; also consider the diseases that the patient may present, to be considered as possible factors that contribute to an increase in triglyceride and cholesterol values that can increase the BMI.
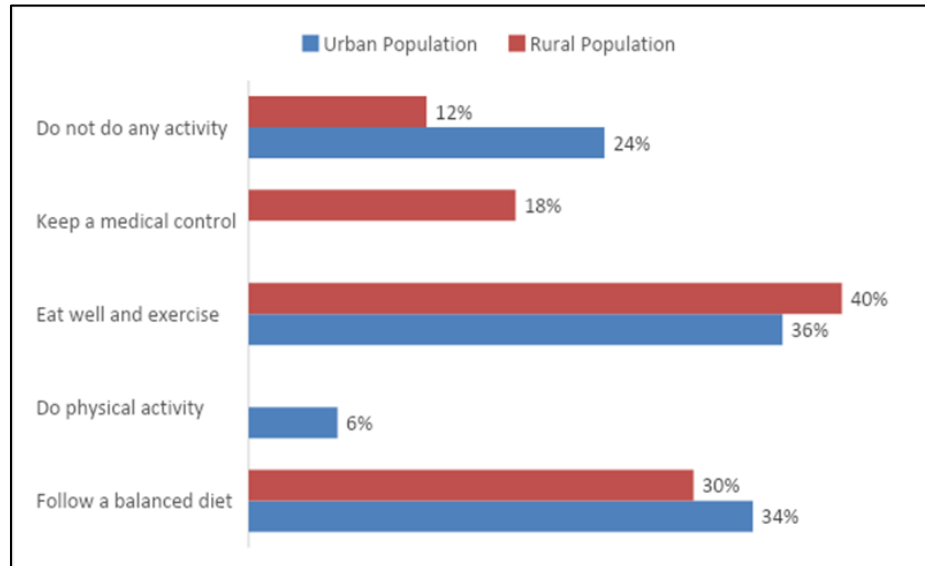
Figure 2. Activities you do as part of your self-care
Source: survey results

The activities carried out by the urban population as part of self-care is following an adequate diet, which is carried out by 34% of users, 6% carry out physical activity, 36% carry out both activities, and 24% do not. perform any activity to take care of your health; Likewise, 30% of rural users follow a balanced diet, 40% eat well and exercise; 18% maintain a medical control and 12% do not carry out any activity to prevent some type of chronic degenerative disease.

According to the results obtained, both the urban population with 98% and the rural population with 100% want the nursing strategy to continue educating the population in activities to prevent different types of chronic degenerative diseases (van Damet al., 2003; Ciechanowski et al., 2003). For the continuity of the nursing strategy, both populations want different physical activity professionals, nutritionists, psychologists, and doctors to be included; 60% of urban users and 58% of rural users responded. For the continuity of the strategy, 96% of urban users responded that information on images and/or videos of both healthy eating and exercise routines be distributed; likewise, 52% of the users of the rural population responded, that this activity within the strategy allows them to see the process of each information sent (Bauman et al., 2012).

Due to the high health cost, its high incidence, and the seriousness of the complications of Chronic Non-communicable Diseases (CNCD) they are considered a global problem; Among its factors are the modifiable ones that are lifestyles, we focus on eating habits and physical activity, for which it is important to mention that it has been shown that education and health promotion help significantly to improve them (Telama et al., 2005). The investigation had a sample of 87 people (39 patients in the rural area and 48 in the urban area) but due to different inconveniences of the users, 1 person was withdrawn from the urban area and 6 from the rural area, having a sample of 33 participants rural and 47 urban participants; obtaining the following data through the application of the survey.

- The model that was chosen for the development of the survey was Dorothea Orem's self-care theory, the same one that is mentioned in the digital magazine (Peña & Salas, 2010) in the magazine digital Nursing Globar -EG where they mention that the theory provides the theoretical support that guides the care that nursing delivers and the nursing process constitutes the tool that allows delivery of this care through a systematic and rational planning method.
- The results obtained within the diseases currently diagnosed, 19% of the urban population has arterial hypertension as well as 6% of the rural population, and between 6% of urban and 12% of rural have other diseases; data that is related to the study by (Sánchez-Chaparro et al., 2019), which showed figures of 13% of the population receiving some type of hypertensive treatment.

- Keeping a lipid control is not something common that all people do, however, it must be evaluated and balanced to avoid different diseases, so 30% of the urban population and 42% of the rural population do not have lipid control; It also includes the time that it is carried out for this, from one to three months of control only 13% of the urban population and 24% of the rural population have controlled it, however only 19% of urban and 9 % of the rural ones remember the values obtained to follow care in the diet and exercises since 36% of the urban ones and 40% of the rural ones present high levels of the lipid profile, these results are related to the investigation of (Garcia et al., 2016) indicated that 50% of the subjects presented high values in their lipid profile and the other 50% showed desirable values.
- To all these results, the majority of the population knows the problems that the alteration of the lipid profile can cause, since 77% of urban users and 58% of rural users confirm it in the results of the survey; however, 36% of urban users carry out adequate nutrition and exercise to prevent various diseases, unlike rural users, where 40% apply these activities; These results are related to the research of (Merchán et al., 2016) where it shows that adequate eating habits and physical exercise have a beneficial effect on dyslipidemias since 60% of the population decreased total cholesterol values, the 66.7% reduced LDLc, the population increased HDLc values from 43.3mg/dl to 47.5mg/dl and triglycerides remained at 131mg/dl, which is within desirable values

The lipid profile indicates the values of cholesterol and triglycerides that the body has, these values can be found at different levels that can cause various health problems, for this reason, it is necessary to monitor and carry out activities that allow the lipid profile to be balanced

4 Conclusion

With the application of the strategy, the variability of clinical practice can be documented, to improve care in the care and care process of patients, analyze its causes and adopt new actions, these have proven to be initiatives that encourage decision-making. effective and safe decisions, centered on patients since the relevance of these will depend on the situations of the patients, such as the presence of cardiovascular disease, familial hypercholesterolemia, familial combined hyperlipidemia, family history of cardiovascular disease or premature mortality or, in the absence of these, of the coronary risk of the patients.

The results of this work are related to people's self-care, since they make it possible to improve health, due to triglyceride complications, and nursing interventions focused on health promotion and prevention are relevant. The strategy met its objectives of motivating and encouraging healthy lifestyles in patients, promoting balanced diets in fats, carbohydrates, proteins, and sugars, performing physical activity adapted to their daily rhythms of life; as well as to carry out routine check-ups to rule out any alteration in the organism that causes the lipid profile to rise.

References

Bauman, A. E., Reis, R. S., Sallis, J. F., Wells, J. C., Loos, R. J., Martin, B. W., & Lancet Physical Activity Series Working Group. (2012). Correlates of physical activity: why are some people physically active and others not?. *The lancet*, *380*(9838), 258-271. https://doi.org/10.1016/S0140-6736(12)60735-1

Blain, H., Rolland, Y., Tuaillon, E., Giacosa, N., Albrand, M., Jaussent, A., ... & Bousquet, J. (2020). Efficacy of a test-retest strategy in residents and health care personnel of a nursing home facing a COVID-19 outbreak. *Journal of the American Medical Directors Association*, *21*(7), 933-936. https://doi.org/10.1016/j.jamda.2020.06.013

Brenner, M. E., Mayer, R. E., Moseley, B., Brar, T., Durán, R., Reed, B. S., & Webb, D. (1997). Learning by understanding: The role of multiple representations in learning algebra. *American Educational Research Journal, 34*(4), 663-689.

Ciechanowski, P. S., Katon, W. J., Russo, J. E., & Hirsch, I. B. (2003). The relationship of depressive symptoms to symptom reporting, self-care and glucose control in diabetes. *General hospital psychiatry*, *25*(4), 246-252. https://doi.org/10.1016/S0163-8343(03)00055-0

Cuevas, A., & Alonso, R. (2016). Dislipidemia diabética. *Revista Médica Clínica Las Condes, 27*(2), 152-159.

Dahlöf, B., Sever, P. S., Poulter, N. R., Wedel, H., Beevers, D. G., Caulfield, M., ... & Ascot Investigators. (2005). Prevention of cardiovascular events with an antihypertensive regimen of amlodipine adding perindopril as required versus atenolol adding bendroflumethiazide as required, in the Anglo-Scandinavian Cardiac Outcomes Trial-Blood Pressure Lowering Arm (ASCOT-BPLA): a multicentre randomised controlled trial. *The Lancet*, *366*(9489), 895-906. https://doi.org/10.1016/S0140-6736(05)67185-1

Ferriols, E., Rueda, C., Gamero, R., Vidal, M., Payá, A., Carreras, R., Flores-le Roux, J. A., & Pedro-Botet, J. (2016). Comportamiento de los lípidos durante la gestación y su relación con acontecimientos obstétricos desfavorables. *Clínica e Investigación en Arteriosclerosis, 28*(5), 232-244.

García, A. I., Niño-Silva, L., González-Ruiz, K., & Ramírez-Vélez, R. (2016). Volumen de grasa visceral como indicador de obesidad en hombres adultos. *Revista Colombiana de Cardiología, 23*(4), 313-320.

Gonzales, G. F., & Tapia, V. (2013). Asociación de los diferentes niveles de hipoxemia en la altura con el perfil lipídico y la glucemia en varones y mujeres a 4.100 m de altitud en los Andes Centrales del Perú. *Endocrinología y Nutrición, 60*(2), 79-86.

Gorostidi, M., Sánchez-Martínez, M., Ruilope, L. M., Graciani, A., Juan, J., Santamaría, R., del Pino, M. D., Guallar-Castillón, P., de Álvaro, F., & Rodríguez-Artalejo, F. (2018). Prevalencia de enfermedad renal crónica en España: impacto de la acumulación de factores de riesgo cardiovascular. *nefrologia, 38*(6), 606-615.

Greene, E. D., Weber, F. R., Rodríguez, G. C., & Chavarría, M. J. O. (2020). Prevalencia del hígado graso no alcohólico y su asociación con alteraciones bioquímicas en una población mexicana asintomática. *Acta Médica Grupo Ángeles, 18*(2), 127-132.

Guo, Z., Liu, X. M., Zhang, Q. X., Shen, Z., Tian, F. W., Zhang, H., ... & Chen, W. (2011). Influence of consumption of probiotics on the plasma lipid profile: a meta-analysis of randomised controlled trials. *Nutrition, Metabolism and Cardiovascular Diseases*, *21*(11), 844-850. https://doi.org/10.1016/j.numecd.2011.04.008

Hurtado, C. J. Z., Cedeño, G. L. A., Espinosa, A. E. A., & Arcentales, M. A. P. (2020). Utilidad del índice aterogenico en la predicción de enfermedad coronaria. *RECIMUNDO, 4*(1 (Esp)), 78-89.

José, Z. S., Maureen, R. G., Domingo, V. M., & Carlos, C.-d. (2012). Lípidos séricos en escolares y adolescentes sanos chilenos de estrato socioeconómico alto. *Revista Médica Clínica Las Condes, 23*(6), 693-698.

Kalliomäki, M., Salminen, S., Poussa, T., Arvilommi, H., & Isolauri, E. (2003). Probiotics and prevention of atopic disease: 4-year follow-up of a randomised placebo-controlled trial. *The Lancet*, *361*(9372), 1869-1871. https://doi.org/10.1016/S0140-6736(03)13490-3

Lahsen, M. R. (2014). Síndrome metabólico y diabetes. *Revista Médica Clínica Las Condes, 25*(1), 47-52.

Langsted, A., & Nordestgaard, B. G. (2019). Nonfasting versus fasting lipid profile for cardiovascular risk prediction. *Pathology*, *51*(2), 131-141. https://doi.org/10.1016/j.pathol.2018.09.062

McEnroe-Petitte, D., & Farris, C. (2020). Using gaming as an active teaching strategy in nursing education. *Teaching and Learning in Nursing*, *15*(1), 61-65. https://doi.org/10.1016/j.teln.2019.09.002

Mehta, K., Balaraman, R., Amin, A. H., Bafna, P. A., & Gulati, O. (2003). Effect of fruits of Moringa oleifera on the lipid profile of normal and hypercholesterolaemic rabbits. *Journal of ethnopharmacology*, *86*(2-3), 191-195. https://doi.org/10.1016/S0378-8741(03)00075-8

Merchán, A., Ruiz, Á. J., Campo, R., Prada, C. E., Toro, J. M., Sánchez, R., Gómez, J. E., Jaramillo, N. I., Molina, D. I., & Vargas-Uricoechea, H. (2016). Hipercolesterolemia familiar: artículo de revisión. *Revista Colombiana de Cardiología, 23*, 4-26.

Palmett-Ríos, H. E. (2017). Estudio transversal sobre estilos de vida saludable y su relación con el colesterol HDL en la población adulta. *Revista Colombiana de Cardiología, 24*(5), 523-531.

Paoli-Valeri, M., Guzmán, M., Jiménez-López, V., Arias-Ferreira, A., Briceño-Fernández, M., & Arata-Bellabarba, G. (2005). Perfil lipídico aterogénico en niños con hipotiroidismo subclínico. Anales de Pediatría,

Parra, B. E., Manjarrés, L. M., Velásquez, C. M., Agudelo, G. M., Estrada, A., Uscátegui, R. M., Patiño, F. A., Bedoya, G. d. J., & Parra, M. V. (2015). Perfil lipídico y consumo de frutas y verduras en un grupo de jóvenes de 10 a 19 años, según el índice de masa corporal. *Revista Colombiana de Cardiología, 22*(2), 72-80.

Peña, Y. N., & Salas, M. C. (2010). Modelo de Dorothea Orem aplicado a un grupo comunitario a través del proceso de enfermería. *Enfermería Global, 9*(2).

Sánchez-Chaparro, M. Á., Pérez-Martínez, P., Ibarretxe, D., Suárez-Tembra, M., & Valdivielso, P. (2019). Criterios de derivación para pacientes a las unidades de lípidos de la Sociedad Española de Arteriosclerosis. *Clínica e Investigación en Arteriosclerosis, 31*(1), 26-30.

Sanzana, M. G., & Durruty, P. (2016). Otros tipos específicos de diabetes mellitus. *Revista Médica Clínica Las Condes, 27*(2), 160-170.

Suárez, N. P., Prin, M. C., Luciani, S. L., Pilottó, M. T., Dri, M. a., & Politti, I. R. (2008). Prevalencia de factores de riesgo de enfermedad cardiovascular: obesidad y perfil lipídico. Anales de Pediatría, ISSN 1695-4033, ISSN-e 1696-4608, Vol. 68, Nº. 3, 2008, págs. 257-263.

Telama, R., Yang, X., Viikari, J., Välimäki, I., Wanne, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: a 21-year tracking study. *American journal of preventive medicine*, *28*(3), 267-273. https://doi.org/10.1016/j.amepre.2004.12.003

van Dam, H. A., Van der Horst, F., Van den Borne, B., Ryckman, R., & Crebolder, H. (2003). Provider–patient interaction in diabetes care: effects on patient self-care and outcomes: a systematic review. *Patient education and counseling*, *51*(1), 17-28. https://doi.org/10.1016/S0738-3991(02)00122-2

Biography of Authors

Miryam Patricia,
Bachelor of Nursing, Master of Health Management for Local Development
Tenured, Professor at the Universidad Laica Eloy Alfaro de Manabí
ORCID 0000-0002-8294-5571
Email: patricia.loor@uleam.edu.ec

María Augusta,
Bachelor of Nursing Sciences, Master of Health Management for Local Development, Professor at the Universidad Laica Eloy Alfaro de Manabí
ORCID 0000-0002-5503-2937
Email: maria.quijije@uleam.edu.ec

Daylin,
Bachelor's degree in Microbiology, Master's degree in Child Nutrition
Full professor at the Universidad Laica Eloy Alfaro De Manabí
ORCID 0000-0002-4053-3165
Email: daylin.fleitas@uleam.edu.ec

Dolores Mirella,
Bachelor of Nursing, Master's Degree in Health Management for Local Development
Full Professor of the State University of South Manabí
ORCID 0000-0002-8572-0327
Email: Dolores.cedeño@unesum.edu.ec